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A TRANSECT THROUGH THE PANAMINTS:
AN ARCHEOLOGICAL SURVEY ALONG THE EMIGRANT-WILDROSE HIGHWAY, DEATH VALLEY NATIONAL MONUMENT

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by

ALBERT C. OETTING

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Western Archeological Center
National Park Service
Tucson, Arizona

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ABSTRACT

An archeological survey was done along 18.1 mi of road in the Panamint Range of Death Valley National Monument, California. This survey was performed and this report prepared to aid planning for reconstruction of the Emigrant-Wildrose Highway (Route 8) and to provide archeological data on a region and setting that have received little attention in the past. A 1/8-mile-wide corridor centered on this road was intensively surveyed. Fifteen sites were recorded and 25 isolated artifacts were recovered.

Discussions of the present and past environmental setting of the area, previous research in the area, and survey requirements and methods are included here as background. A cultural narrative, including local ethnography and history, is presented for the region, and a chronological sequence to replace the traditional Death Valley I-IV sequence is discussed.

Sites and cultural material, both prehistoric and historic, were found throughout the project and should be considered significant since so little work has been done in the area. Evaluations of the sites were limited, owing to the nature of the survey, but the sites are discussed and hypotheses on which future research can be based are suggested. Two groups of sites are of particular interest. Four historic sites in Wildrose Canyon exemplify the region's mining history. A group of sites and isolated finds with early-Holocene (Period II) time associations are very significant. Such sites have rarely been encountered in an upland desert scrub setting and may demonstrate an important aspect of early settlement-subsistence systems.

Management concerns are presented and recommendations to avoid disturbance of the sites during the road construction are made. The need for a monument-wide research design is cited, and several avenues for future research in and near the project area are explored.

INTRODUCTION

Death Valley National Monument lies west of the southern Sierra Nevada and north of the Mojave Desert. It comprises about 3,200 mi^2 of rugged desert country in southeastern California, with a small section in southwestern Nevada (Fig. 1). This area of spectacular relief, extreme aridity and complex geology has long fascinated visitors. The National Monument was created in 1933 to preserve these features.

Access to the Monument from California is by three main routes. These are California State Highway 190 from the Owens Valley, State Highway 127 from Baker in the Mojave Desert, and State Highway 178 from Ridgecrest, connecting with the Trona-Wildrose Highway. Reconstruction of portions of the Trona-Wildrose Highway prompted the present archeological investigations. Eighteen miles of this road, also known as the Emigrant-Wildrose Road and Route 8, are scheduled for widening and/or realignment to improve safety and to minimize the effects of flash floods on the road surface.

The area this road passes through has seen extensive historic use as a transportation and communication route. Mining has been prevalent in the area. Prehistorically, the Death Valley region was occupied for a long period, but little is known of the area to be affected by this project. An intensive archeological survey was conducted from October 10, 1979, to October 26, 1979, by four archeologists from the Western Archeological Center in Tucson, Arizona. It was conducted to discover the presence of cultural resources, to assess their potential significance, to assess the effects this project might have, and to determine how any conflicts might be resolved.

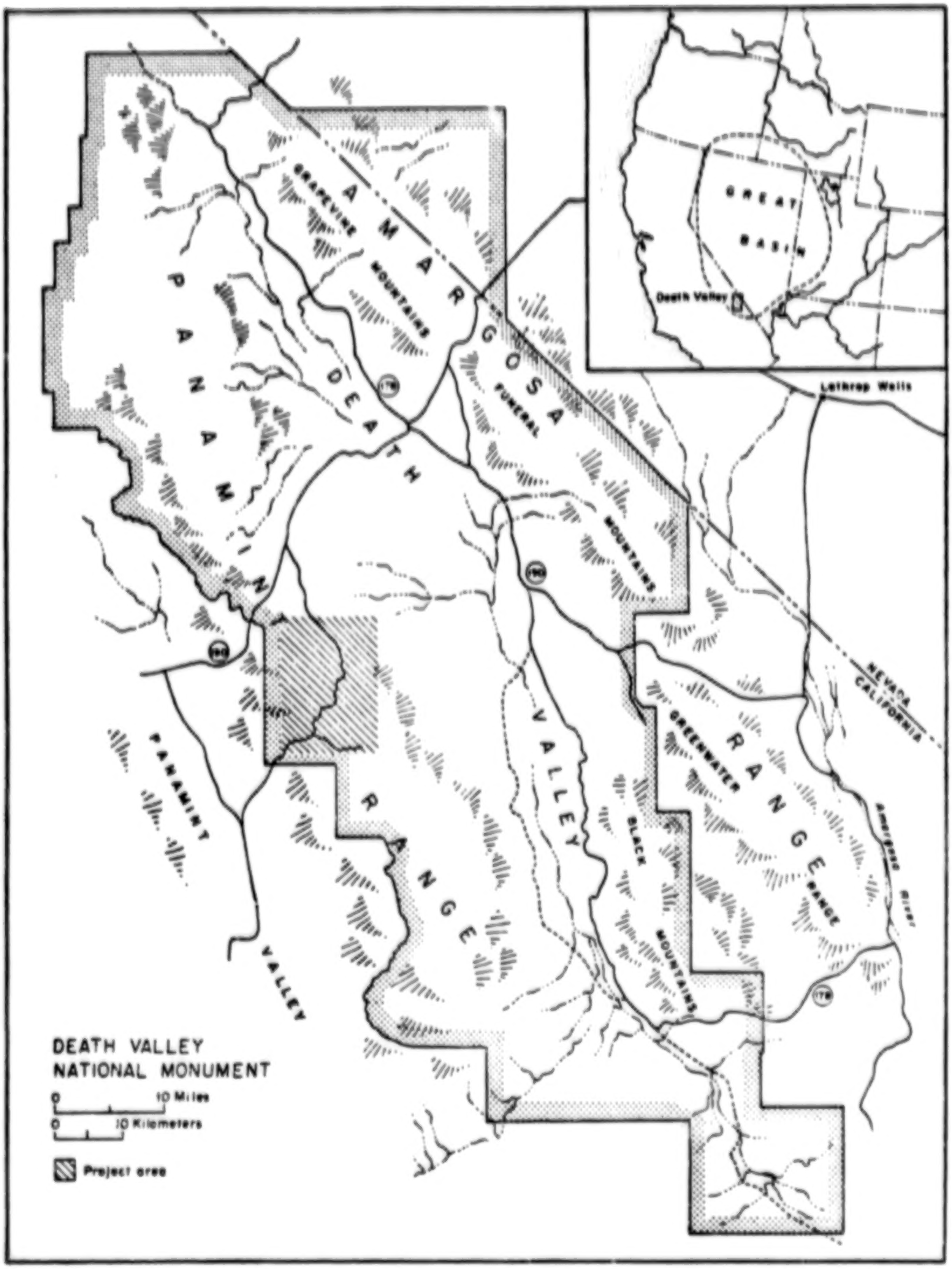

Fig. 1: Death Valley National Monument, showing area under study.

Chapter 1

ENVIRONMENTAL SETTING

Geography

Death Valley is one of a number of valleys comprising the California element of the Basin-Range geomorphic province (Durrenburger and Johnson 1976: 17; Norris and Webb 1976: 6). It is characterized as a region of interior drainage and elongate, northwest-southeast trending mountains and valleys (Norris and Webb 1976: 91). This province is one section of the larger area of internal drainage known as the Great Basin, which extends throughout Nevada and includes western Utah, southern Idaho, southeastern Oregon and southeastern California. The Basin-Range province is much more extensive in Nevada, but its most spectacular development is in California (Norris and Webb 1976: 91), where the extremes between the high narrow mountain ranges and the deep long valleys are most pronounced.

Nowhere is this more evident than in Death Valley. West of the valley is the Panamint Range, crowned by Telescope Peak at 11,049 ft. This peak is visible from Badwater 15 mi to the east, which at 282 ft below sea level is the lowest point in the western hemisphere. The Black Mountains border Death Valley on the east. They rise so steeply that at Dantes View, 2 mi east of Badwater at 5,475 ft, one can see neither the base of the slope nor Badwater (Norris and Webb 1976: 95).

The complex geology and geography of Death Valley reflect its relative youth. They are the results of recent geologic activity, earth movements that uplifted the surrounding mountains and caused the valley to sag between them (C. Hunt 1975: 2). This topographic variation has resulted in various microenvironments in a region climatically characterized as a desert (Norwood and Bull 1978: 10).

Descriptions of the Monument's environmental setting generally focus on Death Valley itself. This trough-like depression dominates the area, extending north-south almost 140 mi (Wallace 1977: 2). Extreme aridity and intense summer heat have made the valley so well known that one tends to forget there is more to Death Valley National Monument than Death Valley. The project area lies in the Panamint Range west of Death Valley, east of Panamint Valley (Fig. 1).

The Panamints are a fault-controlled range, block-faulted on the west and tilted down to the east (C. Hunt 1975: 2). The range rises to a single north-south crestline, with the flanks cut by steep, narrow canyons along most of its length. There are some upland flat areas. The project area consists of two canyons: Wildrose, descending the west side of the range, and Emigrant, which descends north to Emigrant Wash, a huge alluvial fan on the west side of Death Valley (Fig. 2). South from Emigrant Canyon the project area passes across the large upland plateau known as Harrisburg Flats through Emigrant Pass and proceeds along the hills above White Sage Flats, another large flat. It crosses two canyons, Nemo and "A", before descending a small side canyon, known as Rattlesnake Gulch, into Wildrose Canyon. It follows Wildrose Canyon down to the point at which its alluvial fan opens into Panamint Valley. The project area ends at the monument boundary, which runs across this fan. Elevation varies from about 4,400 ft at the northern boundary of the study area in Emigrant Canyon, to 4,900 ft on Harrisburg Flats and then to 5,470 ft at Nemo Crest before descending to 2,450 ft at the Monument boundary on the edge of Panamint Valley.

Geology

The geology of the Death Valley region is very complex. It contains excellent examples of recent faulting, huge alluvial fans in the valley, sand dunes and Precambrian to Holocene rocks in the mountains, thus reflecting most of the main subdivisions of geologic time (Norris and Webb 1976: 95). The valleys and mountains of the region are primarily fault-controlled. Most are large normal faults: rotation on these has caused downward tilting on the east side of the range blocks (Norwood and Bull 1978: 16). The Panamint, Funeral and Grapevine ranges are all tilted fault blocks, each with a steep western face bounded by young normal faults and a gentle eastern slope (Norris and Webb 1976: 108).

Faulting in Death Valley began in the Late Pliocene and continues today (Hinds 1952: 72). Scarps in unconsolidated alluvial gravels provide good evidence of recent faulting activity, most being only a few hundred to a few thousand years old (Norris and Webb 1976: 106). One of the most obvious of these scarps is a 1 mi x 4 mi graben at the mouth of Wildrose Canyon on the east side of Panamint Valley (Hinds 1952: 71;

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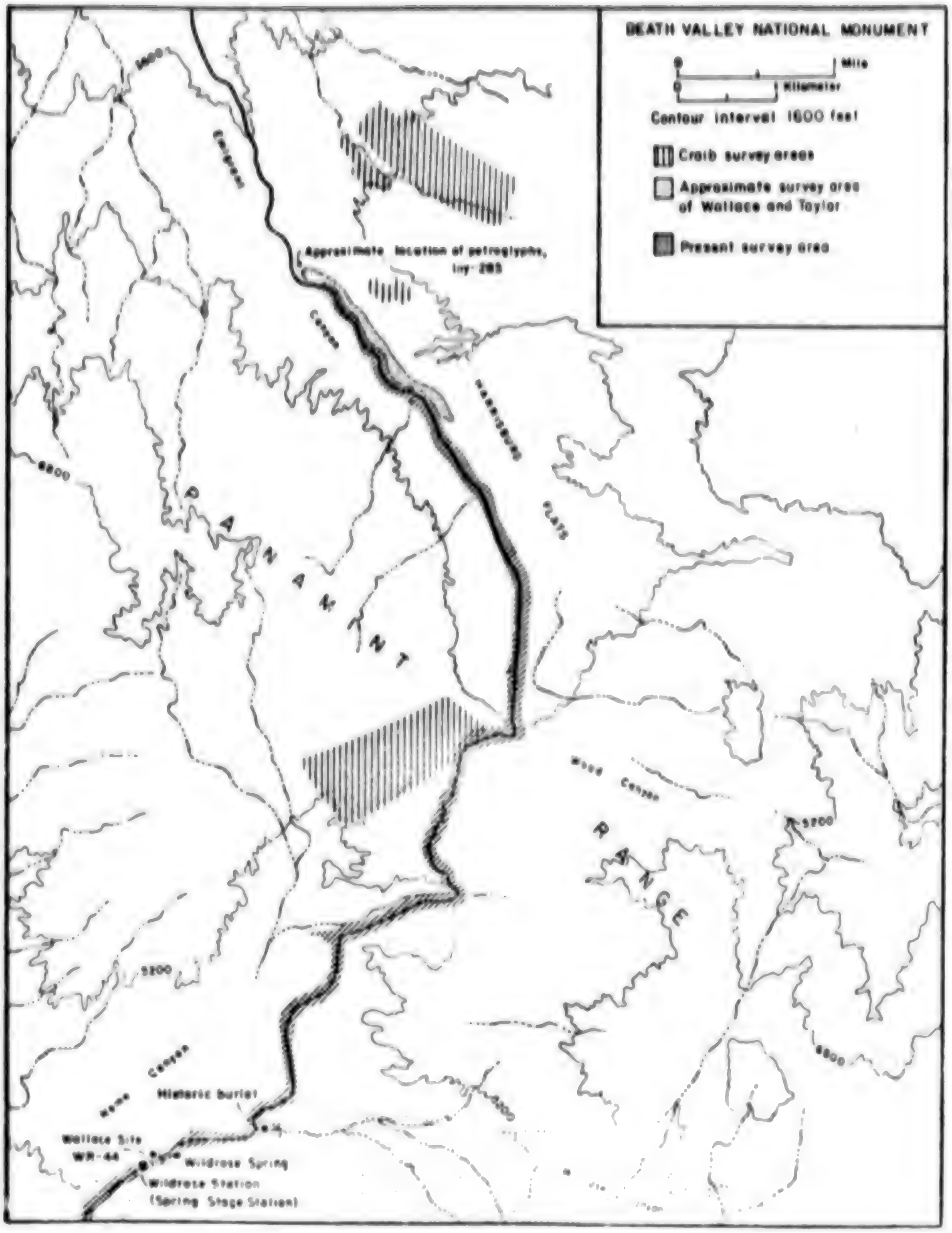

Fig. 2: Areas covered by present and earlier archeological surveys.

Norris and Webb 1976: 106-107). The graben block here has dropped nearly 200 ft.

Because of the complex faulting and the region's sparse vegetation, Basin-Range rocks are well exposed. Some of the oldest rocks in California, Precambrian schists and gneiss dated to 1.8 billion years, are found on the western Black Mountains and in the southern Panamints (Norris and Webb 1976: 97; C. Hunt 1975: 6). Slightly younger Precambrian sedimentary and metamorphic rocks are found in the project area, forming the ridges that separate Wildrose, "A", Nemo and Wood canyons (State of California 1977). Other geologic formations in or near the project area include occurrences of Cambrian-Precambrian rocks near the highway, and the Plio-Pleistocene Coso formation that comprises most of the Pinto Peak area west and north of the project area. A large exposure of Pliocene andesite volcanic tuff is visible in Emigrant Canyon. Most of the canyon floors and Harrisburg Flats are covered with deposits of Holocene alluvium (State of California 1977). The Harrisburg Flats area is a remnant of the geography that existed before block faulting produced Death Valley (Kirk 1976: 49-50), but its surface is now alluvium.

There are many other geologic features that, while not in the project area, affected the prehistoric inhabitants of the area and have directed much of the historic use of the region. Prehistoric groups made use of the sand dunes and of the large springs discharging in fault zones (C. Hunt 1975: 26), and probably obtained salt from the Salt Pan. Numerous sources for lithic material may be found throughout the area. The major historic interest in the area has been in its mineral content (Norwood and Bull 1978: 14-15). Gold, silver, copper, lead, antimony, zinc and talc have been mined in the mountains. The Salt Pan has yielded an amazing complex of saline minerals (C. Hunt 1975: 39-40), resulting in the borax industry in Death Valley in the 1880s.

Hydrology

The hydrology of the project area reflects the general water systems of the Death Valley region. The washes in Emigrant and Wildrose canyons and in White Sage and Harrisburg Flats carry heavy runoff from rains, but the streams run only briefly. Springs are the only permanent water sources. Springs in or near the project area are found in Emigrant and Wildrose canyons. The water quality of these springs is good. They discharge along thrust faults, and their flow is constant but low in volume (DOI 1977: 33-34).

Modern Environment

Climate. Death Valley is one of the most consistently hot areas of the world (Craib 1978: 24). Summer temperatures routinely reach 110°-120°F, dropping only 30° at night. Winter temperatures in the valley are fairly moderate, with daytime temperatures in the 60°-80°F range and nights rarely below freezing (Wallace 1977: 2-3). The mountains tend to be cooler than the valley, the temperature dropping about 3.5°F for every 1,000 ft gain in altitude. This was a major factor in building the original summer headquarters of the Monument in the Panamints in Wildrose Canyon. While summers at Wildrose are more tolerable, winters can be very cold.

Death Valley is also one of the driest areas in the world. Annual precipitation is about 1.5 in, most of it falling in winter (C. Hunt 1975: 7). It is also very variable, some years recording absolutely no precipitation and others recording up to 4 in. Elevation affects rainfall, increasing as one proceeds upslope. Above 5,000 ft the increase is about 2 in for every 1,000 ft (Wallace 1977: 4). Snow, which caps much of the Panamint Range in winter, accounts for much of the precipitation at higher elevations.

Flora and Fauna. Flora and fauna in California have been divided into five major biotic provinces (Munz and Keck 1959: 10-11). The Nevadan province covers most of the Great Basin area, including Death Valley National Monument.

Flora. The vegetational responses to temperature (and elevation) have been correlated into the concept of Life Zones, of which Death Valley has elements of Lower Sonoran, Upper Sonoran and Canadian (C. Hunt 1975: 187). This system is less than satisfactory for the Eastern Sierra Nevada (Storer and Usinger 1970: 26) and the Basin-Range area, because plants occurring in these zones differ from plants occurring in the same zone elsewhere. Some of the zones are missing completely. Therefore, flora is discussed here in terms of vegetation types and plant communities (Munz and Keck 1959: 10-18; Ornduff 1974: 61-69).

Three vegetation types are recognized: scrub, desert woodland and coniferous forest (DOI 1977: 35). Scrub or desert shrub vegetation accounts for almost 75 percent of the Monument's landscape. Within this vegetation type, four communities--alkali sink, creosotebush scrub, shadscale scrub and sagebrush scrub--are found. The desert woodland vegetation contains the pinyon-juniper woodland community. The subalpine forest and bristlecone pine forest are the plant communities of the coniferous forest.

The alkali sink community surrounds the salt pans and playa areas of Death and Panamint valleys (Ornduff 1974: 110). Creosotebush scrub and shadscale scrub communities make up the majority of the project area's flora, with localized blends of the sagebrush community. Creosotebush scrub usually is found in the valleys and on slopes and hills up to about 3,500 ft, but creosotebush is found to almost 5,000 ft near the Nemo Crest in the project area (DOI 1977: 37). Creosotebush (*Larrea divaricata*) is the dominant species, usually widely spaced with plants 2 to 10 ft high. Other species present include burro brush (*Franseria dumosa*), brittlebush (*Encelia farinosa*), cheesebush (*Hymenoclea salsola*), desert holly (*Atriplex hymenolytra*), beavertail prickly pear (*Opuntia basilaris*) and desert trumpet (*Eriogonum inflatum*) (Ornduff 1974: 112). There are no sharp breaks between the creosote scrub and the shadscale scrub community. These higher altitude (3,000 to 5,000 ft above sea level) species tend to be smaller--1 to 2 ft tall--and, again, widely spaced. Species common to this community include saltbush and shadscale (*Atriplex* spp.), blackbrush (*Coleogyne ramosissima*) spiny sagebrush (*Artemisia spinescens*), hop sage (*Grayia spinosa*) and Mormon tea (*Ephedra* spp.) (Ornduff 1974: 109).

The sagebrush community is found between 4,000 and 7,000 ft above sea level and might be better termed the blackbrush community, owing to the greater abundance of this plant (DOI 1977: 38). The blending of this community with the lower shadscale community gives the latter the appearance of a transition zone between the creosotebush and sagebrush/blackbrush communities, rather than of a distinct community. The dominant species is blackbrush (*Coleogyne ramosissima*), with localized occurrences of big sagebrush (*Artemesia tridentata*). Another major species prevalent in the study area is rabbitbrush (*Chrysothamnus* spp.). Vegetative cover is greatest in this community (DOI 1977: 39).

The pinyon-juniper woodland community is found on the mountain slopes above the project area and throughout the Monument at elevations of 7,000 to 9,500 ft. The nuts of the pinyon pine (*Pinus monophylla*) were a vital part of the subsistence cycle of native Shoshone groups. The subalpine forest and bristlecone pine forest communities cannot be readily separated. The limber pine (*Pinus flexilis*) and bristlecone pine (*Pinus longreva*) occur mainly above 10,000 ft in the Panamints (DOI 1977: 39).

Within all these communities, special ecotone associations may be found. These include associations at springs and along washes, as well as at the bases of steep hills or cliffs and areas with a high water table (DOI 1977: 38).

Fauna. Although Death Valley is characterized as a barren, arid land, it supports quite a variety of fauna. Mammals, birds, reptiles, and insects are well represented (Wallace 1977: 7-8). The burro, the most obvious animal present in the project area, was introduced to the region in the late 1800s by miners. It is hard to say what kind of effect the now feral burros are having on the natural environment of the project area, but at higher altitudes they are restricting the bighorn sheep's natural range. Small rodents, such as woodrats, pocket mice and squirrels, are the most plentiful mammals. Harrisburg Flats originally was named Perognathus Flat by C. Hart Merriam's 1891 expedition, owing to the multitude of pocket mice there (Jaeger 1975: 15). Other mammals include rabbits and predators, such as coyote, kitfox and badger.

Many species of birds visit the Monument on migrations, but few make it their home (Wallace 1977: 9). Ravens and hawks hunt lizards, small rodents and other prey in the project area. Lizards are the most common reptile in the Monument, with 17 species ranging from the gecko to the large chuckwalla (Jaeger 1975: 25-27). Snakes also are common. The small Pacific tree-frog is present. Insects are somewhat more obvious than normal because of the many large varieties (Jaeger 1975: 29). Species of crickets, beetles, flies, ants and moths all are seen in the project area.

Effective Environment

The effective environment is that portion of the total environment used by humans (Craib 1978: 24). The desert scrub, which covers most of the project area, contains few plants regularly used by the local Shoshone. Few of the dominant species are usable. Creosote, used in southern California for medicinal purposes, was used in Death Valley to make an adhesive for arrow points (Coville 1892: 358). Steward (1938: 73) states that the Panamint Shoshone gathered seeds from grasses in the mountains during the summer months. He doesn't specify the plants involved, but they probably include Indian sandgrass (*Oryzopsis* spp.), chia (*Salvia columbariae*), evening primrose (*Oenothera* spp.), and blazing star (*Mentzelia* spp.), all of which may occur within the project area. Mormon tea also was used, the stems being brewed to make a drink and the seeds roasted. The fruit, flower buds and young fleshy joints of the beavertail prickly pear were used. In times of drought or food shortage a wider range of plants was used. Seeds of the sagebrush, usually avoided because of their bitterness, were used when needed (Wallace 1977: 42).

The project area lies below the pinyon-juniper zone, but Wildrose and Nemo canyons are natural access routes from Panamint Valley to this heavily used zone. The pinyon nut was considered the single most important ethnographic food source in areas where it occurs (Steward 1938: 27). Other utilized plants in this zone include tree yucca, for fiber and edible flower buds; rushes (*Juncus parous*), for fibers and seeds; and various seed grasses.

The animals used most often by native groups were small mammals, birds and reptiles (Wallace 1977: 38), species of which are present within the project area. Rabbit constituted the chief game and was hunted or trapped by individuals or in communal drives (Steward 1938: 73). The pocket mice of Harrisburg Flats and other small rodents could provide a steady source of meat. Large lizards were eaten, as were some insect species (Wallace 1977: 40).

Past Environment

An environment similar to that of today has been considered a major factor in past human cultural adaptations to the Great Basin (Jennings

1964: 150). However, the environment has not been so constant throughout the region. It has undergone a number of minor changes in the last 12,000 years (Martin and Mehringer 1965: 440). While these changes have not been major climatic shifts, the impact on human populations may have been significant. It must be remembered that the project area is in an upland environment, where climatic variations would be more sharply felt, and that the overall climate would be somewhat cooler and moister than the valley environments usually cited in the literature.

Both paleobiotic and geological data provide evidence of prior climates. Pollen samples may be obtained from a number of sources, including archeological sites and corings from lakeshore sediments, springs, marshes and peat bogs (Mehringer 1967a, Mehringer and Warren 1976). Analyses of these give good chronologies for specific sites and can indicate general trends in the vegetational and climatic history of a region. Palynological studies have been done in a number of locations in the region, but not in the setting of the project area.

The middens of fossil woodrats (Neotoma) are very important (Norwood and Bull 1978: 24; Craib 1978: 21). They often contain well preserved botanical macrofossils, some dating as early as 40,000 BP. The woodrat has a restricted home range but diverse gathering habits, so that plant remains found provide a good indication of plant types for a restricted geographic and elevational range. Because these remains are organic, radiocarbon dates may be obtained. Excavation and analysis of such middens have been done in a number of areas in the Great Basin and the southern California deserts (Norwood and Bull 1978: 24-25; Craib 1978: 21).

Geologically, evidence of climatic change can be seen in the type and quantity of soil deposition or erosion, sand dune activity, peat formation in marshes, and fluctuations in lake levels. This last seems surprising for the arid landscape of southeastern California, but during much of the Pleistocene an extensive lake system existed in the area. Lake Manly, the Pleistocene lake of Death Valley, reached a maximum depth of 600 ft and was 90 mi long by 6 to 11 mi wide (Blackwelder 1933: 468). It was the final overflow basin for the Owens and Amargosa rivers. The Owens River drainage included Owens Lake, China and Searles lakes, Panamint Lake (in Panamint Valley) and a final overflow through

Wingate Wash into Lake Manly (Morrison 1965: 279-280). The levels of these lakes fluctuated throughout the Pleistocene, presumably responding to the continental glacial advances and retreats. Since they were interconnected only during glacial peaks, these lakes have separate histories controlled by the local precipitation and watershed (Davis 1978b: 18). Although there are numerous problems and disagreements on the interpretation of these data and a number of regional distinctions, general trends can be seen.

The environment of the Pleistocene fluctuated from desert conditions similar to those of the present (Morrison 1965: 267) to the overflow lake periods. The last maximum stand for Lake Manly was about 11,000 BP to 10,500 BP (Hooke 1972: 2093). During much of the Pleistocene the composition of vegetational belts was similar to that of the present, but the belts were lower in elevation. Between 23,000 BP and 12,800 BP there was a vertical downward displacement of the temperate and subalpine woodlands by 900 m to 1,200 m throughout the Southwest (Butzer 1971: 367, 369). The lower areas of this region generally had pinyon-juniper woodlands, while higher elevations had spruce-yellow pine forests (Butzer 1971: 267; Martin and Mehringer 1965: 439). Temperatures were cooler and precipitation greater during these periods. The presence of humans in the New World and their distribution during this period is still a matter of some debate (see below), but the southeastern California area would have been a favorable environment for much of that time.

The Pleistocene-Holocene boundary is placed at about 12,000 BP in the Southwest (Martin and Mehringer 1965: 439; Mehringer 1967b: 251). Rapid environmental change is seen throughout much of the area, but conditions approaching those of today were not seen until about 7500 BP to 7000 BP (Mehringer 1967b: 251). This desiccation resulted in the retreat and disappearance of the Pleistocene lake systems and the higher placement of vegetational belts. The environment of the Holocene has not seen the great fluctuations of the Pleistocene, but it has not been constant. At least five shallow Holocene lake cycles have been determined at Lake Lahontan in central Nevada (Morrison 1965: 265). Similar cycles are seen at Mojave, China and Searles lakes and at Lake Manly (Norwood and Bull 1978: 19-23). The Holocene lake in Death Valley reached a depth of 30 ft between about 4950 BP and about 1950 BP (C. Hunt 1975: 13). Displacement of vegetational belts is seen through the pollen record, but the shift was only about 150 m to 600 m lower than present for most of the period (Martin and Mehringer 1965: 445; Mehringer 1967b: 251). This would suggest that much of the project area was pinyon-juniper woodland, but no palynological studies have been done in the area to verify this.

An Altithermal period, with a climate more severe than at present, has been suggested by a number of researchers and disputed by many others (Weide 1976). Wallace (1977: 26) suggests an occupational hiatus in Death Valley during this period, which he dates at 7000 BP to 5000 BP. Such a period would probably have affected individual areas differently. Archeologically, the evidence--or lack of it--suggests a somewhat lower population during part of the middle Holocene throughout the Great Basin (Baumhoff and Heizer 1965: 702).

The environment of the project area, on the basis of the above information, seems to have undergone fairly significant change since the beginning of the Holocene about 12,000 years ago. The lower vegetational belts would have given Harrisburg Flats and the region above White Sage Flat a probable pinyon-juniper community. The increased variety of available resources would have made the area more favorable for human use and occupation. These changes in the placement of vegetational belts should be considered when analyzing the relationship of site types to the environment. Robert Bettinger (1976: 89; 1977a: 15) argues that the pinyon-juniper community was not used to any great extent until after AD 600. Not considered is the possibility that earlier sites not presently within this zone were within it when the sites were active. While precipitation rates are not known for this altitude, it probably would have been moister than the valleys and moister than at present. Whether standing ponds or streams fed by snowmelt were present to provide more reliable water sources also is unknown, but there probably was more water available than at present.

Chapter 2
PREVIOUS RESEARCH

Archeological Research

Organized archeological investigation has been conducted sporadically in the Death Valley region since 1925, but recognition of early human activity dates to observations by William Manly, a member of one of the 1849 emigrant parties (Wallace 1977: 93-94). Rock art was reported by explorers and prospectors in the late 1800s, including some in upper Wildrose Canyon. Petroglyphs on a ledge in Emigrant Canyon, within the present survey area, were noted and photographed by C. Hart Merriam's 1891 expedition (Mallery 1893: 61).

The first archeological survey was conducted in 1925 by Malcolm Rogers, a pioneer of California desert archeology, who examined an area near Saratoga Springs. Wallace (1977: 97-98) reports that collectors were active after this date, and that little planned investigation was done. Since 1950 there has been a return to a more organized appraisal of the area's archeological resources.

The vast majority of the work within the Monument was done in the late 1950s by William J. Wallace and Alice Hunt. Wallace's surveys and excavations included diverse areas of the Monument, such as Mesquite Flats (1954, 1968b), Butte Valley (Wallace and Taylor 1956), Saratoga Springs (1958a, 1978b; Wallace and Taylor 1959), Furnace Creek Wash (1968a), Ubehebe Crater and the Grapevine Mountains (1968a, 1968b), and Wildrose Canyon (Wallace and Taylor 1955). Alice Hunt conducted extensive investigations in the valley around the salt pan and on nearby alluvial gravel fans (A. Hunt 1960). All this work has resulted in surveys over less than 10 percent of the Monument's area and must be considered a judgmental sample only.

Based on this small sample and on his experience in the region, Wallace (1958b: 10-15) devised the four period Death Valley chronological sequence more fully described in Hunt's (1960) monograph. This sequence was subsequently altered and expanded to apply to all of the southern California desert region (Wallace 1962). The periods of the Death Valley I-IV chronology have been refined somewhat and are the basis for Wallace's culture history in his archeological overview of the monument (Wallace 1977: 110-134).

Since the present survey was done on the western edge of the Monument and in an upland setting, previous research in nearby Panamint Valley and other areas of the Panamint Range are pertinent. A survey in the northern Panamints near Racetrack Valley was conducted in 1951, focusing, for the most part, on rockshelters (Lathrap and Meighan 1951: 11). As a result of this survey, Coville Rockshelter was excavated in 1953 (Meighan 1953). No great time depth was postulated for any of the sites found. Wallace and Taylor (1955) conducted the Wildrose Canyon survey in 1953. The major portion of the survey was done in the upper canyon, above the Wildrose residence area, but part of the canyon in the present project was included (Fig. 2). The entire area was not fully surveyed and, unfortunately, exact boundaries of surveyed areas are not known. Forty-five archeological sites were recorded (Wallace and Taylor 1955: 6), only one of which, a lithic workshop, was located in the current project area.

Major work was done in Panamint Valley in the 1960s by Emma Lou Davis. She excavated a number of sites around Lake Hill in northern Panamint Valley and conducted reconnaissances at a number of areas in the valley and on Hunter Mountain (Davis 1970: 90). These investigations resulted in a reappraisal of the "Paleo-Indian" period and the definition of the "Western Lithic Co-Tradition" and of a regional lithic technology named the "Panamint Basalt Industry" (Davis, Brott and Weide 1969). In a related project, late prehistoric and protohistoric Shoshonean occupations near Indian Ranch south of Wildrose Canyon were excavated (True, Sterud and Davis 1967: 17).

In 1976 a survey of 187 mining claims within the Monument was made (Craib 1978). Included in this project were three survey areas in the Emigrant-Wildrose area (Fig. 2). Four claim groups were located in the hills between Emigrant Canyon and Tucki Mountain (Craib 1978: 57). No prehistoric sites were located, but the townsite of Skidoo is within one of the claims. White Sage Flat was surveyed as a part of National Register activities connected with the survey (Craib 1978: 88). The survey here included a small portion of the present survey area just south of Emigrant Pass. No prehistoric or historic sites were located, although some isolated artifacts were noted. Arcane Meadow, on the trail to Telescope Peak, also was examined (Craib 1978: 86). Two sites, a possible temporary hunting camp dated to the Rose Spring/Eastgate period on the basis of recovered projectile point types and an historic structure, were located. These investigations and Wallace and Taylor's 1953 Wildrose Canyon survey are the only known surveys within the immediate project area.

In 1976-77 the Bureau of Land Management's Desert Planning Staff conducted a survey of three of its planning units, including Panamint Valley. It was sampled with an aligned systematic sample stratified according to ecological zones (Norwood and Bull 1978: 154). Forty-six sites (excluding isolated finds) were recorded, half of which were lithic scatters in a creosote biotic setting (Norwood and Bull 1978: 166, Table 10). The rest were scattered over seven biotic settings and eight site types. Site type also was compared with land form. Again, site types were thinly scattered over 11 land form categories--the only concentration being 19 lithic scatters on alluvial fans. Only three sites--a milling station, a cemetery and an historic site--were found in the mountain land form (Norwood and Bull 1977: 171, Table 14). No detailed information on actual location or possible age of these sites was made available.

Ethnographic Research

The 1891 Death Valley Botanical Expedition was responsible for the first ethnographic descriptions of the Panamint Indians. Short but valuable contributions were made by Frederick Coville (1892), the expedition's botanist; E. W. Nelson (1891), a biologist, and B. H. Dutcher (1893), the group's ornithologist. The three descriptions seem to form the basis for Kroeber's chapter on the Panamint, or Koso, in his massive but dated Handbook of the Indians of California (1925: 589-592).

By far the most important ethnographic research to be done in the region was that of Julian H. Steward. He spent many years in the field gathering data, which resulted in a wealth of information, both ethnographical and archeological. He published an important ethnography on the Owens Valley Paiute (1933) and in 1938 examined the Shoshone and other sociopolitical groups of the western Great Basin. In this work he describes the Shoshone and Kawaiisu groups of the Panamint Valley and northern Death Valley, discussing specific population estimates, local social and political organization, and detailed settlement-subsistence activities. The last item is of great importance, since he lists names, locations and sizes of native villages and camps and discusses the functions they served. This is a great help in attempting to locate and evaluate them in the field.

Historic Research

Because of the interest in the Forty-Niners in Death Valley, much historic research has been done, resulting in many small but useful popular publications (e.g., Belden 1956; Hubbard, Bray and Pipkin 1965; Koenig 1971). Scholarly research into the routes of the first emigrants and subsequent visitors to the region (Wheat 1939a, 1939b) has also provided a wealth of information on the early history.

The area is rich in mining history, and numerous pamphlets and books describe the rise and decline of various mines and towns. Some of these include very valuable data, such as a 1907 map of Skidoo and the Wild Rose Mining District, which illustrates the entire project area.

Overviews

Four overviews dealing with the region's archeology and history have been published. Wallace's (1977) archeological overview provides appendices summarizing all archeological surveys and excavations done within the Monument, and locates and briefly describes all archeological and ethnological collections from the monument.

A much more useful archeological overview of the region is the Bureau of Land Management study done by Richard Norwood and Charles Bull. They focus on a number of valleys west of the Monument, but their discussion of the archeology (1975: 50-81) considers a much wider area, which is necessary in evaluating Great Basin archeology. They give an in-depth review of the development of chronologies throughout the southwest Great Basin and provide an explicit rationale for the chronological sequence they adopt. Their sequence is followed in this paper in an attempt to reduce the proliferation of isolated regional chronologies. Their overview also provides a good history of the Panamint Valley area. Their study, when paired with Benjamin Levy's historical background study for the Monument (1969), yields a good understanding of the region's history.

An overview of cultural resources in the Monument by William Tweed (1976) provides photographs of a number of historic areas, but little information. At present, another historical overview of Death Valley National Monument is being prepared by the National Park Service's Western Region Historic Division. Their report should be published in 1980.

Chapter 3

REGIONAL CULTURAL NARRATIVE

Any meaningful examination of the culture history of the project area must include not only Death Valley and Panamint Valley, but also the larger areas of the southwest Great Basin and the nearby southern California deserts (Fig. 1). The Great Basin is a physiographic region with a wide area of similar arid environments, as in upland southern California. These conditions were met by broadly similar cultural adaptations. But local environmental conditions and change have affected these adaptations.

Work in these regions has been spotty and localized, resulting in numerous regional chronologies. Some of these (Rogers 1939; Wallace 1962; Davis, Brott and Weide 1969) have been generalized to account for wider areas, which has resulted in a confusing plethora of names for various postulated stages, complexes, periods and traditions. This is especially true of the southern and eastern California area. As Hester (1973: 68) states, "Any student of western prehistory is no doubt aware of the chaotic state of culture definition and sequence which has characterized the southwest basin." This chapter summarizes the various presentations and examines the local cultural sequence established for Death Valley. Because of the relatively small sample on which the Death Valley chronology was based and the emphasis placed on the valley, and because legislatively imposed political boundaries have no prehistoric cultural significance, a wider regional synthesis is employed to more effectively discuss the area's culture history.

Traditional Death Valley Sequence

Since the vast majority of work done in Death Valley has been viewed in terms of the Death Valley I-IV sequence of Wallace (1958b, 1962, 1977) and Hunt (1960), a review of it is necessary.

Death Valley I (7000-5000 BC), known as the Nevares Spring Culture. Sites have been found only in the valley, on gravel benches near ancient springs or waterways. Lake Mohave and Silver Lake points and assemblages characterize this period and suggest that hunting was a major activity. No grinding tools or skeletal remains have been found.

An occupational hiatus is suggested for the period of 5000-3000 BC. This period is not well understood, but Wallace (1977: 115) believes climatic change forced the abandonment.

Death Valley II (3000 BC-AD 1), known as the Mesquite Flat Culture. Two phases are seen, based on projectile points and milling. The Early Phase is found only in the valley, is characterized by Pinto and Gypsum points, and lacks milling tools. The Late Phase is marked by the introduction of milling tools and the use of Elko point types. Sites for this phase are found in many areas of the Monument. Rock art is believed to have been introduced at this time.

Death Valley III (AD 1-1000), known as the Saratoga Springs Culture. This period was a development of the Late DVII group. Rose Spring and Eastgate points are found, suggesting the use of the bow and arrow. Some Puebloid artifacts, such as pottery and clay figures, suggest contact with groups in southern Nevada. Sites of this period are found throughout the valley and at some upland rockshelters and springs.

Death Valley IV (AD 1000-ca 1870), known as the Panamint (Shoshone) Culture. These people are assumed to be the direct ancestors of the historic Shoshone. They replaced or assimilated the Saratoga Springs people. Pottery is introduced in this period and the major point types are Desert Side-Notched and Cottonwood. In the valley, sites are found in sand dunes near mesquite trees. Upland sites, generally lacking ceramics, also are known, reflecting a seasonal subsistence pattern.

Wallace (1962) expanded on this chronology to propose one for all of the southern California deserts. The periods here were named: I, Lake Mohave; II, Pinto Basin; III, Amargosa; IV, Prehistoric Yuman and Shoshonean. The general characteristics of each were basically the same as those of the Death Valley sequence.

An Onslaught of Terms

Time depth is always an important consideration in developing a cultural sequence. Both Jennings (1974: 174; Jennings and Norbeck 1955: 2) and Willey (1966: 342) believe the Great Basin was one of the first areas occupied by humans in the New World, although reliably dated evidence for this has not been found. They, and most other archeologists, do not accept the controversial sites in southern and eastern California for which great time depth is claimed. Sites such as Texas St, Buchanan Canyon and Scripps Campus in San Diego (Carter 1957; Minshall 1976), Santa Rosa Island (Orr 1960), Calico (Leakey, Simpson and Clements 1968), Manix Lake (Simpson 1958), basal levels of Tule Springs (Harrington and Simpson 1961), and Manly Terrace in Death Valley (Clements and Clements 1953) have been offered as evidence for human presence in the New World dating to 40,000 BP and possibly to 80,000 BP. All have been disputed, the main concerns being whether the artifacts are genuine (not naturally flaked stone) and/or whether they are directly associated with the material being dated (Hester 1973: 59; Jennings 1974: 78-81).

The earliest assemblages recognized as clearly being the product of human activity (Norwood and Bull 1978: 47) are those identified by Malcolm Rogers (1939: 6) as the Malpais Industry. This crude pebble industry lacked projectile points and was felt to be antecedent to the San Dieguito-Playa Complex (Playa I and II), which included large projectile points now known as Lake Mohave types. Most sites were surface scatters and could not be dated. However, the artifacts of the lowest levels of Ventana Cave, the Ventana Complex, were equated with San Dieguito I (Malpais) and were associated with extinct Pleistocene fauna (Rogers 1966: 37; Haury 1950: 534).

The Malpais and San Dieguito-Playa terms were abandoned and replaced with the San Dieguito I-III sequence, which was found in four geographic areas, or "aspects" (Rogers 1966). His Central Aspect included the southeastern California area and the project area. His original terms for the later cultures--Pinto-Gypsum Complex and Amargosa Industry (Rogers 1939)--were changed to the Amargosa I-III sequence (Brott 1966: 140). Amargosa has also been used by Gordon Willey (1966: 353-355) to describe the period characterized by Elko and Rose Spring/Eastgate projectile points. This would be Rogers' Amargosa III and probably the periods of Puebloid intrusion, Basketmaker III and Pueblo II (Brott 1966: 140). His final periods are those of prehistoric and historic Yuman and Shoshonean groups.

It is apparent that by the mid-1960s the area was becoming a "terminological jungle" (Davis, Brott and Weide 1969: 3) (Fig. 3). In addition to these period terms, names for individual "cultures" or

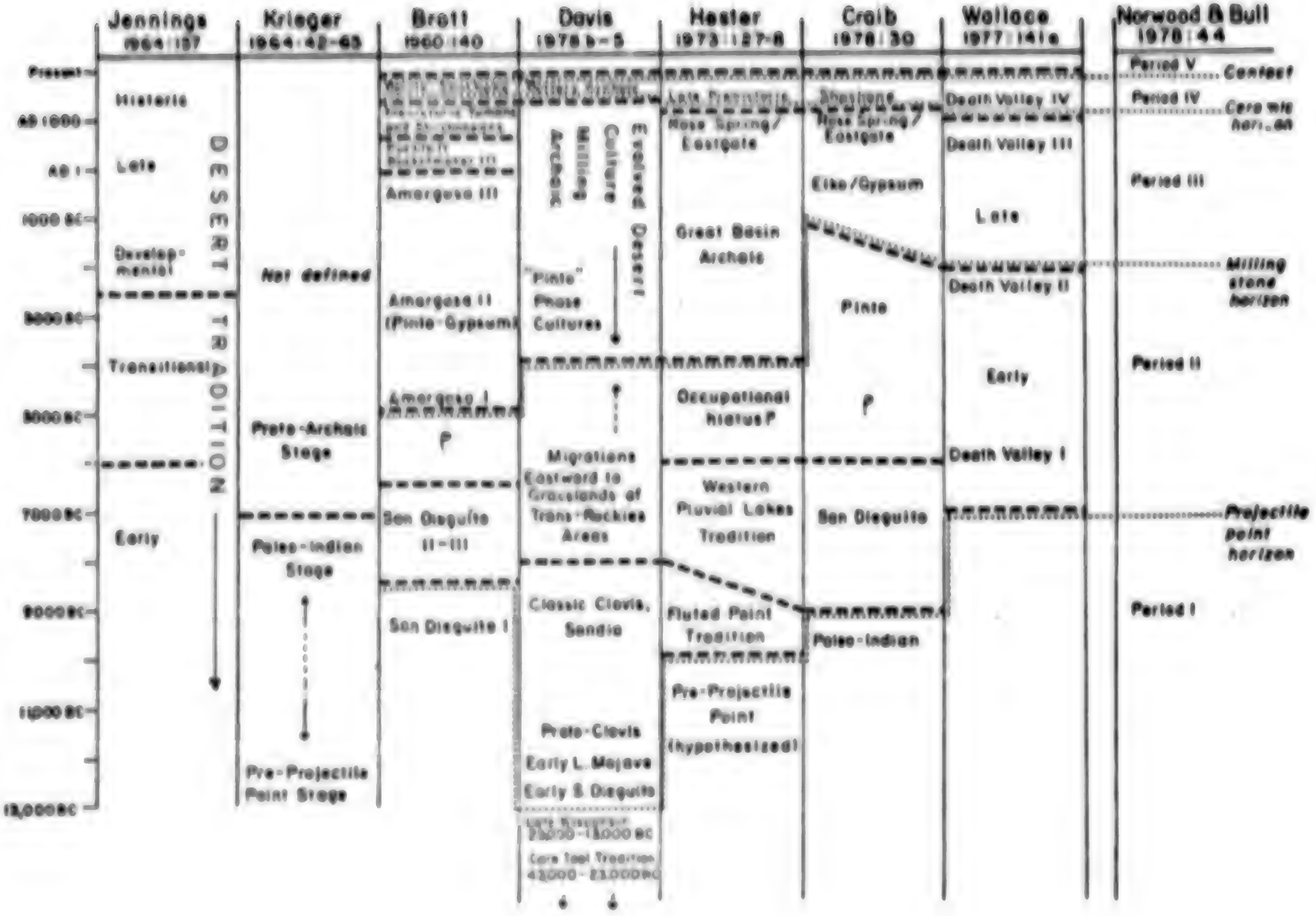

Fig. 3: Comparison of eight chronological schemes developed for the area under study.

assemblages also had sprung up. These usually were named after the type site, such as Lake Mohave Culture (Campbell et al 1937), Pinto Basin (Campbell and Campbell 1935), Gypsum Cave (Harrington 1933), and Rose Spring (Lanning 1963). These named assemblages spawned specific projectile point types, which have also been used to order chronologies (see below). Clark Brott (Davis, Brott and Weide 1969) presented a taxonomic system to standardize terminology, but it seems to be too cumbersome to be used effectively (Tuohy 1971: 417).

Another sequence with its roots in the Early Man controversy is that recently postulated by Davis (1978b) from her work at China Lake and in the Mohave Desert. She feels the Great Basin was the most favorable New World environment, and so supported the earliest human groups. A sequence of eight periods arbitrarily beginning 45,000 years ago (Davis 1978b: 31) is proposed, based mainly on the weathering of artifacts and their morphology and technology (Davis 1978b: 5). Expansion into the Great Plains and further east did not occur until 11,500 BP after a long core tool tradition and the development of early projectile point types, including Clovis (Davis 1978b: 13). As Davis admits (1978b: 4), this chronology has yet to be adequately tested (MacNeish 1979: 631).

Much of Davis' chronology would probably be lumped with the other Early Man sites and sequences by Alex Krieger (1964) under his Pre-Projectile Point Stage. This term also is used by Gordon Willey (1966: 37), who believe it has validity, by Jennings (1964: 151) and by Hester (1973: 127), both of whom, while doubting much of the existing evidence, feel the concept is correct. Krieger's (1964: 51) next stage is Paleo-Indian, the period of big game hunting usually associated with the Pleistocene megafauna and the classic fluted projectile point. Also included are the various other projectile point types thought to have followed the fluted point period. His third period (1964: 59) is known as the Protoarchaic Stage and consists of various individual sites and local complexes, all of which have the presence of milling in common. Willey and Phillips (1958) also recognize these stages, but label them differently.

While these stages were developed to include sites and sequences continent-wide, the precepts defining each stage are important and have been employed in the Norwood and Bull (1978) chronology (see below).

Desert Culture

In response to what he saw as a widespread cultural adaptation to an arid environment over a long period (Hester 1973: 55), Jesse Jennings (Jennings and Norbeck 1955) defined the Desert Culture. It was argued that the environment of the Great Basin has been essentially the same as today's for the last 10,000 to 12,000 years (Jennings 1964: 150; 1974: 66-67). The Desert Culture, or Desert Archaic, was a stable, successful adjustment to this environment--a stage rather than a functionally integrated cultural complex (Jennings 1964: 153). This period was thought to have developed soon after the beginning of the big game hunting tradition (Llano) of the Great Plains and to have survived into historic times (Willey 1966: 55-60). Most of the sites and complexes of the Great Basin were included within this stage, and a long list of traits was drawn. One of the major traits was the presence of milling apparatus (Jennings 1964: 154).

This hypothesis was soon questioned by many who felt there was greater diversity among Great Basin cultures (Hester 1973: 57) and that this concept was too limiting. Owing to a wider range in local environments--and some of these environments did change through time (as discussed above)--there was a greater variety of local cultural responses to specific microenvironments.

Projectile Point Based Chronologies

Hester (1973) has reviewed the question of chronological ordering in the Great Basin and has examined the various methods used for dating. Projectile point types are valuable in Great Basin chronology because many sites lack any other means by which they can be dated. Within the western Great Basin a number of point types with restricted temporal and geographic distribution have been defined (Hester 1973: 23), allowing their use as time indicators (Fig. 3).

A number of these point types are important in the southwest Great Basin. Despite opinions to the contrary (Jennings 1974: 94; Willey 1966: 59), numerous fluted points have been found in the southwestern Great Basin and southern California (Tuohy 1970; Davis and Shutler 1969; Grosscup 1960; Davis and Fortsch 1970; Davis 1969, 1970). Most are similar to the famous Clovis points (Wallace 1978a: 25-27). While most have been surface finds and so are undated, a re-examination of the Borax Lake Site in northern California (Meighan and Haynes 1970) showed that the claimed date of 12,000 BP was not inconsistent with the available geological and typological evidence. A number of points similar to the Clovis type but lacking the flute also have been noted at sites in southeastern California and Nevada (Krieger 1964: 37). Work on the slopes of ancient Lake Mohave (Campbell *et al* 1937) led to the definition of the Lake Mohave and Silver Lake point types and of an associated Lake Mohave tool assemblage (Amsden 1937). They have been found at many sites in the region. Davis (1978b: 47) feels these stemmed points and fluted points developed concurrently in southeastern California. The Pinto series consists of a number of varieties first defined by Amsden (In Campbell and Campbell 1935: 43-44) from the Pinto Basin sites in the Mohave Desert and later refined by Harrington (1957: 51-53) on the basis of a large collection from the Stahl Site near Little Lake. Another series with many variants is the Elko series, first defined in Nevada by Heizer and Baumhoff (Hester 1973: 29). Rose Spring and Eastgate points were defined separately (Hester 1973: 33); Eastgate may represent a localized development, but dates overlap and the types are quite similar, both being much smaller and lighter than preceding types. The Desert Side-Notched and Cottonwood points are small, distinctive, well-dated point types, often co-occurring on late sites (Hester 1973: 37).

Hester proposed a culture history based on many methods, but the most apparent indicators of periods were the changing projectile point types. He hypothesizes (Hester 1973: 27) a *Pre-projectile Point Period* and possible man-megafauna associations around 11,000 BC. Succeeding this is a *Fluted Point Tradition*, poorly understood but probably dating to 8000-10,000 BC, characterized by the distinctive fluted point types. Dated 9000-6000 BC is the *Western Pluvial Lakes Tradition*, represented by a specialized tool kit and a lacustrine adaptation and site placement. The pertinent point types are Lake Mohave and Silver Lake. The *Great Basin Archaic* subsumes most of the attributes of the Desert Culture and continues some lake-shore oriented adaptations. Elko, Pinto and Gypsum points and milling represent this period, which is dated to about 6000 BC to AD 500. The proposed introduction of the bow and arrow and concomitant changes in point types marks the next period, which is named for its characteristic points, the *Rose Spring-Eastgate Complex*. It is dated AD 500-1000. The *Late Prehistoric Period*, AD 1000 to historic contact, is marked by the introduction of ceramics and the use of Desert Side-Notched and Cottonwood points. The cultural remains of this period are attributed to Numic speakers (Paiute and Shoshone). The *Post-Contact Period* rounds out Hester's chronology.

John Craib (1978: 29-35) adopts a cultural chronology based on this succession of projectile point styles in his survey of mining claims in Death Valley National Monument. He explicitly states that these periods do not necessarily presume large scale cultural developments. His periods *Paleo-Indian* (pre-projectile point and fluted points; ?-9000 BC), *San Dieguito* (Lake Mohave, Silver Lake types; 9000-6000 BC), *Pinto* (4000 -700 BC), *Elko/Gypsum* (2000 BC-AD 500), *Rose Spring/Eastgate* (AD 500-1200), and *Shoshone* (AD 1200-historic) are, in general, close to those of Hester. The distinctions reflect the fact that the chronology is designed for the Death Valley area. No Paleo-Indian period sites have been reliably identified. Pinto points, associated with milling elsewhere, are rare in Death Valley and have not been found in association with milling. Thus, they are separated from Elko points, which have associated milling equipment.

George Kritzman (1979) uses a point type-based chronology broadly similar to Craib's. However, he includes another point type--unnotched, rounded base, Saratoga Spring--preceding the Rose Spring type (Kritzman 1979: 41-42). This type was first described but not named by Wallace (1978b: 41-42). This type and the Rose Spring series are contemporaneous at the Saratoga Spring sites in southern Death Valley. Wallace felt that this type, since it was not generally recognized, was often placed in the Cottonwood series, which would follow the Rose Spring type rather than precede it. This makes it difficult to compare.

Norwood and Bull Chronology

The number of regional and general chronologies and the variety of names for various assemblages, complexes, periods, stages, traditions, and so on is staggering. To make matters worse, the same names are used by different authors to denote slightly different concepts. The chronologies of Hester (1973) and Craib (1978) are the clearest and best developed, but both suffer minor but irritating shortcomings. An inherent weakness in projectile point-based chronologies is the overlapping of type periods. In this case, the Elko and Pinto periods overlap to a great degree, and, as Craib states (1978: 33), the Elko series may span an even longer period. This makes it useless as a period marker. The Hester chronology avoids this, since it is based on a number of other features. However, he perpetuates the problem of naming periods, introducing one (Bedwell's Western Pluvial Lakes) and redefining an old one (Archaic). His method of labeling is suspect because tradition, period and complex are not defined.

Another regional sequence proposed by Richard Norwood and Charles Bull (1978) in their overview of several planning units west of Death Valley for the Bureau of Land Management, may avoid some of the problems noted above. They recognize that while there are many different sequences and named periods, they share a number of similarities. To avoid the name problem, five cultural periods are identified and numbered I to V; each is bracketed by a significant cultural horizon (Norwood and Bull 1978: 42). These periods of occupation are defined using a series of major horizons (Fig. 3). The periods are well founded in the archeological record, but "they are completely heuristic devices and make no claim to reflect a cognitive cultural explanation" (Norwood and Bull 1978: 42). The terms horizon and tradition are integrative devices and should not be confused with period, which has both spatial and temporal dimensions and is the segment of an historical sequence in a given area. Horizon is a spatial continuity represented by the broad and rapid spread of cultural traits, linked approximately contemporaneously (Willey and Phillips 1958: 33), while a tradition is mainly a temporal continuity represented by the persistence of specific traits over time (Willey and Phillips 1958: 37). Using these devices to integrate the available data, it is hoped that the periods as presented will be somewhat less confusing (Fig. 3).

Period I. This period begins at a proposed chopper/scraper horizon and ends at the projectile point horizon. Its major temporal trait is a heavy chopper-scraper technology (Norwood and Bull 1978: 45). This base period represents basically the same concept as the pre-projectile point stages discussed earlier. Most admit its probable existence but discount most of the sites ascribed to it (Krieger 1964; Jennings 1964, 1974; Willey 1966). No dates can be applied to this period at present.

Thomas and Lydia Clements (Clements and Clements 1953; Clements 1956) have suggested occupations of both Death Valley and Panamint Valley during this period, but their evidence has been disputed by many archeologists. The Early and Late Core Tool Tradition periods of occupation at China Lake described by Davis (1978b: 38) should be included, as should the San Dieguito I described by Rogers (1966). Artifacts of this period include large core chopper and flake scraper types.

Geographic location of occupation sites is poorly known. Most claims have been near ancient lakeshores, but Rogers (1966: 39) describes most San Dieguito I sites as being near minor dry-wash channels in the deserts, away from both modern water sources and ancient shorelines. Seventy percent of the sites are found below 1,000 ft elevation (Rogers 1966: 39). Whether these statements are valid overall is unknown. Much more work must be done before this period can be more firmly established.

Period II. This period begins with the projectile point horizon and concludes with the milling stone horizon (Norwood and Bull 1978: 50). Temporally, it is linked by a large projectile point trait, comprising a number of styles. These include the fluted points, Lake Mohave and Silver Lake stemmed points, and the ovoid leaf-shaped and leaf-shaped biface points of Roger's San Dieguito II and III (Brott 1966: 167-169).

Materials of this period have been identified in Panamint Valley and Death Valley. The Panamint Basalt Industry of Davis', Brott's and Weide's (1969) Western Lithic Co-Tradition has an assemblage with Lake Mohave and Silver Lake type points, as well as leaf-shaped points/knives similar to the San Dieguito III types. One fragment of a fluted point also was found. In Death Valley, Wallace found four sites containing assemblages of the Lake Mohave/Silver Lake type. It has been assumed that these points and the absence of milling stones represent a hunting orientation. This conclusion is by no means assured since these artifacts may be only a small part of a larger cultural inventory that was not preserved or that has not been recognized. It is possible that some of the postulated Period I sites, such as those of Clements and Clements (1953), are specialized site types of this period, one lacking projectile points. The China Lake artifacts, however, show consistent distinctions in artifact size, flaking technique and weathering, enabling Davis (1978b: 31-33) to describe separate traditions. Few remains of the animals presumably hunted have been found. Mammoth, camel, horse and bison have been found at China Lake, but Davis feels the primary resource base of this period was marshland (Davis 1978b: 80). Sites of this period are found mainly along the shores of ancient lakes and near now dry streams, springs and marshes (Jennings 1964: 159; Rogers 1966: 64; Wallace 1977: 112; Davis 1978b: 81-82). This also is reflected in Hester's (1973) Western Pluvial Lakes Tradition. However, this apparent orientation may be due to sampling error. That is, valleys and ancient lakes have been surveyed but surrounding mountains have not. Davis (1970: 90) reports that Panamint Basalt Industry artifacts were found in sites on Hunter Mountain at about 6,000 ft elevation in the Panamints. She also feels the China Lake groups were using upland plateaus and canyons (Davis 1978b: 80). The people of this period may have been using a wider range of environmental zones than previously thought.

Time estimates for this period are very tenuous. Fluted points generally have been considered older than stemmed and leaf-shaped points, but they have been found on beach levels between lower and higher levels containing Lake Mohave points (Hester 1973: 61-62), and have elsewhere been found in apparent association with other point types. These assemblages, which were identified by Wallace (1978a: 25) as two separate hunting traditions, may have overlapped in time and space. To complicate matters, research at China Lake has led Davis to suggest the development of both Clovis and Lake Mohave points as different expressions "of the same general kinds of cultural blending and technological change" (Davis 1978b: 47). Her sample indicates that late Lake Mohave and Classic Clovis are contemporaneous. Furthermore, she stresses the suggestion that Clovis points developed in the "Lakes Country," the Great Basin, and subsequently spread east (Davis 1978b: 13, 47, 73-74). This process of development would necessitate a time depth greater than that demonstrated by the earliest dated Clovis sites in the Great Plains. Antevs (1937: 48) suggested a date of 15,000 BP for the Lake Mohave artifacts. This date is considered invalid by most, but radiocarbon tests on associated shorelines (fossil shell material) have yielded dates of 6500 to 13,500 BP, and in Panamint Valley the Panamint Industry sites have been associated with radiocarbon dates of about 10,000 BP (Davis, Brott, and Weide 1969: 15).

Period III. The onset of this period is marked by the milling stone horizon and its termination by the ceramic horizon (Norwood and Bull 1978: 57). Its main temporal link is the milling stone technology, but the period incorporates a number of assemblage characteristics highlighted by a variety of projectile point types. The major point types of this period are the Pinto series, Gypsum points, Elko series, Rose Spring series and Eastgate points.

The amount of information available allows some intra-period differentiation (Norwood and Bull 1978: 59). The Rose Spring and Little Lake (Stahl) sites in the Owens Valley are important because they illustrate the stylistic variation of the point types and, since they are stratified, the relative chronological ordering. The Pinto, Elko (and Gypsum), and Rose Spring sequences are seen here. In Death Valley there are some anomalies. The Elko series may be less valuable as a time marker (Craib 1978: 33), and the few Pinto points identified have not been associated with a milling technology. This could be due to any one of many factors that present sampling has not yet identified. Many more sites are known from this period than the preceding ones, and there are a number of large midden sites. Whether this is due to increased population, greater sedentism or simply sample error is unknown. Sites of this period are found in a variety of habitats.

Some of the material found by Wallace in Wildrose Canyon may represent use of this region during this period (Wallace and Taylor 1955: 365). Some of the projectile points collected may be classed as Elko and Rose Spring, and some are similar to Pinto shoulderless types. Milling equipment is present, but it probably relates to the following period. Craib (1978: 82) rechecked these sites and recorded three new ones. Diagnostic artifacts included Elko series points, but no milling implements. This may represent a seasonal use of the area during Period

III, as Craib suggests, but this should be considered an hypothesis to be tested, not an established pattern.

There are a number of dates for the onset of the milling horizon (Norwood and Bull 1978: 58). They include 6950-7950 BP (Hester 1973: 125), 9500 BP (Norwood and Bull 1978: 58), and 4450-4950 BP (Wallace 1962: 175). The lateness of Wallace's date is due to his proposed occupational hiatus (see above). Norwood and Bull (1978: 58) feel that such a hiatus is possible, but that there is not yet enough information to confirm it. They also feel there is too little evidence to discuss a nonceramic Yuman and Shoshonean presence in the region (Norwood and Bull 1978: 66).

Period IV. This period begins with the ceramic horizon and continues to historic contact (Norwood and Bull 1978: 68). It is characterized by a number of additions to the assemblage: ceramics, new projectile point types, and the mortar and pestle. The new point types are the Desert Side-Notched series and the Cottonwood. The pottery is an undecorated brownware generally referred to as Owens Valley Brown Ware. Many have suggested that the introduction of pottery marks the arrival of a new group. It represents a significant change in the material assemblage in the western Great Basin, but does not confirm the presence of a new group (Norwood and Bull 1978: 68). The possibility of a preceramic Yuman or Shoshonean occupation in the region makes this distinction necessary.

Since this period terminates with historic contact, the ethnographically known inhabitants have been presumed to be the descendants of the groups whose archeological remains form the characteristics of Period IV. Use of ethnographic analogy can present problems, but it is a recognized tool. The reconstruction of a group's linguistic past is another tool that may aid the archeologist. Work has been done on the linguistic stocks of the western Great Basin (Norwood and Bull 1978: 72-81), but it has not yet helped to resolve the question of whether ceramics are indicative of new groups.

Sites of this period are the most numerous in the Death Valley area (Craib 1978: 35) and in Panamint Valley (True, Sterud and Davis 1967). They are found in many settings; on valley floors they usually are associated with sand dunes and mesquite stands, while in the uplands they occur mainly within the pinyon-juniper zone. This archeological patterning suggests a correlation with the seasonal patterning of ethnographically known groups (discussed more fully below).

Use of the pinyon-juniper zone by Period IV groups is demonstrated by sites recorded by Wallace in Wildrose Canyon, where he recovered Desert Side-Notched points and some pottery, and discovered three bedrock mortar milling stations (Wallace and Taylor 1955: 359-360). It was stated that sites with these artifacts could be "safely attributed to the modern Indians or their immediate predecessors" (Wallace and Taylor 1955: 365).

Most dates for the ceramic horizon cluster quite near to 1000 BP. The appearance of Desert Side-Notched points dates to approximately this period, while Cottonwood points are considered to be somewhat later (Lanning 1963: 281).

Period V. This is the ethnographic and historic period of occupation, as it begins with the native inhabitants' contact with Euro-American cultures. These groups are presumed to be a continuation of the Period IV cultural groups, but, as discussed above, the time depth represented is unknown. The Death Valley area is known to have been inhabited by three groups, based mainly on geographic and linguistic determinations.

It must be remembered that first direct contact came in 1849, and that contact was seriously disrupting traditional patterns by at least the 1860s through disease and reduction in available resource gathering areas. Since the first ethnographic accounts were done in the early 1890s, and the most thorough examination was not made until the 20th century, it is difficult to say how accurately these accounts reflect traditional lifeways.

Ethnography

Kroeber (1925: 574-580) first described the area's linguistic groups and their boundaries. The Shoshonean (Numic) language group, a subdivision of Uto-Aztecan, covered the largest geographic area within California. He divided Shoshonean into branches, divisions and groups;

the groups reflect individual languages. The three groups known for the area are Paiute (Eastern Mono), Panamint Shoshone (Koso) and Kawaiisu. The project area lies within the boundaries of the Panamint Shoshone, though Steward (1938: 71, Fig. 7) places the Panamint-Kawaiisu border north-south through the Panamint Mountains, probably very near the Harrisburg Flats area. Grosscup (1977) summarizes the various placements and proposes a more southerly crossing of the Panamint Range. These, of course, are not fixed political boundaries, so it is probable that Kos and Kawaiisu speakers used the Panamints in and near the project area (Steward 1938: 71), and that speakers of the two linguistic groups were intermixed in the central part of Panamint Valley.

The Panamint Shoshone territory was the thinnest populated area in California (Kroeber 1925: 589) and was sparse even compared with other Great Basin groups (Steward 1938: 46-49). In 1883 the entire Panamint Shoshone population was estimated at about 150 (Kroeber 1925: 590). Nelson (1891: 373) placed the combined population of the Panamint and Saline valleys at less than 100. The extreme aridity of Panamint Valley resulted in an extremely sparse native population (Steward 1938: 84).

The Panamint Mountains in the vicinity of the project area were used seasonally by groups from Panamint Valley and Death Valley (Steward 1938: 84-86), and the range was sometimes visited by more distant groups (Steward 1938: 82). The subsistence strategies of local people were similar to those of many Great Basin groups that depended on seasonally available food resources. These strategies involved seasonal movement that varied from year to year, depending on local crop abundance, but that, in general, followed an overall annual pattern.

For most of the year subsistence activities were oriented to individual family groups, which congregated during the winter in small villages at springs in the low, warm valleys or lower canyons (Steward 1938: 73). Plants and seeds were the principal food sources, supplemented by small game. The typical seasonal subsistence cycle saw families leaving winter villages in March or April as pine nuts and seeds collected and stored the previous fall were exhausted (Steward 1938: 73). These family groups foraged and camped independently but within the same general area as fellow villagers. After leaving winter camps they began collecting local greens as they ripened. Coville (1892) provides an extensive list of plants used by the Panamint Shoshone and their methods of preparation. As spring and summer progressed, families traveled from place to place as local species became available. Throughout the summer different seed-bearing grasses became available in many places, mostly in the mountains (Steward 1938: 73). Also during the summer, the very important mesquite pods were gathered, some to be boiled and eaten, most to be stored to dry for making into a flour (Wallace 1977: 36). In early fall the major staple of the Panamint Shoshone, the pinyon pine nut, was gathered. The pinyon-juniper plant community on the upper slopes of the Panamint Mountains was the major source of pine nuts in Panamint Valley and Death Valley (Coville 1892: 352; Dutcher 1893: 378). Pine nut harvest often was a communal activity.

Fall saw a number of communal functions before winter village occupation began. Besides the pine nut harvest, communal rabbit drives and festival-mourning ceremonies were held (Steward 1938: 73). This fall festival was the only noneconomically induced gathering of people (Steward 1938: 74). The festivals were annual events, generally hosted by certain villages and attended by those nearby. Activities included the circle dance, gambling and the annual mourning ceremony (Steward 1938: 74). Different villages hosted the festivals by turns. The festivals were made feasible by the increased food supply from pine nut harvests and rabbit hunts, offered the opportunity for increased social interaction, since groups were usually fairly isolated during the rest of the year.

The completion of the annual cycle was a return to the winter villages. This period provided the most permanent association between families (Steward 1938: 232). The villages were usually at low altitudes near the bases of the mountains or in the lower reaches of the mountain canyons. They were small, ranging from one or two families to about five families.

The major sociopolitical unit among the Shoshone was the family, since each family operated independently for much of the year. The largest permanent organization was the village, the larger of which often had a headman or "talker" (Steward 1938: 247). His duties were mainly to keep any interested parties informed as to where and when food resources were available. Good information on the Panamint Shoshone could not be obtained, but they most likely followed this pattern. There was some intervillage cooperation and ties, especially among villages that normally grouped together for the fall festivals, but "there is not a single feature which warrants calling any of them a 'band'" (Steward 1938: 247).

Shamanism was practiced by the Shoshone in the region (Steward 1941: 257). Supernatural powers and guardian spirits were acquired through dreams. Some shamans had general curing abilities, while others could cure only specific ailments. Some individuals had powers only for their own benefit. These powers were bestowed by a dreamed guardian spirit or through dreams of having power over specific things, or both. Shamans usually were male, but women could also acquire dreamed powers and practice.

Winter house structures probably varied from place to place, but they usually were constructed with a circular floor and a conical covering of mesquite or juniper branches (Craib 1978: 36). Summer structures were more temporary, often being nothing more than a roofless brush enclosure or windbreak (Dutcher 1893: 377). Some mesquite and juniper structures have survived to recent times in the area (Wallace and Wallace 1978: 27-29; Sanchez 1973). Wallace (Wallace and Taylor 1955: 359) reported the remains of a juniper structure in a forested side canyon of Wildrose Canyon.

Driver (1937) and Steward (1941) compiled culture element lists for the area. These contain valuable data on numerous aspects of native life, including details of kinship and marriage, religious and medicinal customs, and material culture.

Ethnographic use of much of the project area is uncertain. It does not lie within the mountain pinyon-juniper zone, but Wildrose and Nemo canyons are natural access routes to this zone from Panamint Valley. Emigrant Canyon and Harrisburg Flats may have been used by groups from Death Valley. This whole area also is a natural route for crossing the Panamints. The project area contains plants and animals used by the Panamint Shoshone, so the area may have been used in subsistence activities by dwellers in or near the Panamints. There are a variety of closely spaced microenvironmental zones available throughout most of the

Panamints, making the range a favored resource gathering area (Steward 1938: 82). The only recorded ethnographic presence within the project area is at Wildrose Spring. Steward (1938: 84) states that the spring (Su'^{u}navadu) had a winter settlement with a few residents. Wallace (1977: 59) questions this, since the 4,500-foot altitude would not be very suitable for a winter residence. Wildrose Spring was used as a summer camp by groups from Furnace Creek (Steward 1938: 92). Near the project area, groups from Panamint Valley probably used Emigrant Springs, named Tingah'ni, as a temporary seed-gathering camp, and may have used some springs in Wood Canyon (Steward 1938: 85). The Furnace Creek people also used one of the springs at the head of Wildrose Canyon as a summer camp for seed gathering (Steward 1938: 93).

To summarize, the Panamint Shoshone thinly populated the Death Valley-Panamint Valley area. They were hunters/gatherers who employed a cyclical subsistence pattern, harvesting seasonally available plant and animal foods. The majority of the project area probably was visited intermittently for gathering, but only Wildrose Spring was a known occupation area.

History

Death Valley's historic period is fairly short; it has been 130 years since the valley was recorded and named. The recorded history of the Emigrant-Wildrose project area also dates to this first contact. Though the project area is but a small part of the Monument and is not part of the valley, it has witnessed and played a part in all but one phase of the area's history.

The first documented Anglo-American group to visit Death Valley did so by mistake--one of the many byproducts of the 1849 California Gold Rush. The lure of easily obtained riches in California drew hundreds west in 1849. Arriving at Salt Lake City, many of these groups found that they were too late to attempt a passage of the High Sierra before winter set in. The Mormons advised them of a southern route, following the Old Spanish Trail, which would take them to Los Angeles (Belden 1956: 19-20). Several groups, including the Jayhawkers, the Georgians, the Mississippi Boys, and the families of the Bennett-Arcane party with William L. Manly, banded together under the leadership of Capt. Jefferson Hunt. The size of the party made travel slow, and several of the groups abandoned the Sand Walking Company (Wheat 1939a: 75; Belden 1956: 23) to follow a "short cut" under the direction of a certain Captain Smith. This proved to be disastrous, as Capt. Smith soon disappeared with his pack train and the party fragmented into its component groups. Some returned to Capt. Hunt, but the above-mentioned groups continued, each taking a slightly different route, through some of the most desolate country in the west.

The Jayhawkers arrived at Travertine Springs in Death Valley on December 23, 1849, and the others arrived shortly thereafter (Belden 1956: 30). The Panamints loomed before them, blocking their passage. The Jayhawkers, the Georgians, and the Mississippi Boys, all groups of young men anxious to get to the gold fields, turned north to find a way around or through the Panamints. The Bennett-Arcane group turned south, convinced by Manly that it was the safest route.

The groups of young men ended up abandoning or breaking up their wagons for firewood, killing some of their oxen for food and using the others for pack animals.

The Georgians attempted a frontal assault on the Panamint Range, backpacking up the east side of Tucki Mountain, past the site of Skidoo, and then probably over Towne Pass. This may have taken them through the northern section of the project area. The ultimate fate of this group is unknown, since no records have been found (Wheat 1939a: 81).

The Jayhawkers separated into two parties. One group ascended Emigrant Wash and crossed the Panamint crest through Towne Pass. This route was followed by the two contingents of the Mississippi Boys, one of which was led by Captain Towne, after whom the pass was named (Belden 1956: 33-34). The other Jayhawker party ascended Emigrant Wash but turned south up Jayhawker Canyon after missing the less than obvious entrance to the easy passage through Emigrant Canyon. This has been verified by the discovery of the initial WBR and the date 1849 carved on a boulder near Jayhawker Spring. The initials were those of William B. Roods, one of the Jayhawkers (Wheat 1939a: 89). Above this spring, the group crossed the ridge into Emigrant Canyon near the remains of Journigan's Mill (Wheat 1939a: 90). They continued up the canyon, finding snow and good grazing in Harrisburg Flats and White Sage Flat. They apparently proceeded down Nemo Canyon to its junction with Wildrose Canyon, since the springs in Wildrose Canyon are not mentioned, and then into Panamint Valley. This description would place the party in or near the project area from its northern boundary through Harrisburg Flats and Emigrant Pass, and in the area of the junction of Wildrose and Nemo canyons (Fig. 1).

Levy (1969: 46-47) proposes an alternate route. He suggests that the group continued up Jayhawker Canyon over the ridge just under Pinto Peak and descended through another canyon to Nemo Canyon, thus bypassing Emigrant Canyon and Harrisburg Flats. This route is more direct, but it may not have offered the grazing area required for the Jayhawker stock.

The last people to emerge from Death Valley were the Bennett-Arcane families. Finding the southern Panamints too rugged for their wagons, they established a camp near Bennett's Well while Manly and John Rogers went for help and supplies. They returned to find that the Bennets and Arcanes were the only families still there, the rest having attempted--some successfully--to escape using the meager resources they had left. The popular credit for the naming of the valley goes to Mrs. Bennett, who, after climbing up into the Panamints with the surviving oxen as pack animals, turned and said, "Goodby, Death Valley". Belden (1966: 54) states that other survivors also referred to it as Death Valley or the Valley of Death.

Through the 1850s and later, small groups of prospectors and adventurers combed the Death Valley area looking for the Lost Gunsight lead and the Breyfogle mine (Weight 1970; Levy 1969: 49-5). Several accounts (Chalfant 1922; Norwood and Bull 1978: 118) state that Mormons passed through and possibly did some mining in the area. During this time the great exploratory survey expeditions of the American West were being conducted.

The San Bernadino Meridian Survey supposedly was the first to survey in Death Valley, but it is doubtful that they actually were there (Whitney 1865: 461). It is more likely that Henry Washington, under contract to the General Land Office, was the first surveyor (Levy 1969: 54).

In 1860 Dr. S. G. George of Visalia led a prospecting group into Death Valley over Towne Pass. On their return they found the entrance to and traveled up Emigrant Canyon. On Christmas Day 1860 they crossed into Wildrose Canyon near the present Wildrose residential area and discovered a deposit of antimony ore, which they named the Christmas Gift Lode (Wheat 1939b: 201). Part of this group and another group from San Francisco returned to the Wildrose area in 1861 and formed the Telescope Mining District, their organization being known as Combination Gold and Silver Mining Company (Wheat 1939b: 202), although antimony had been the biggest find.

In 1861 the United States and California Boundary Commission Survey explored the Death Valley area. They are the first documented group to have used the name Death Valley (Levy 1969: 55). This expedition became more a general reconnaissance of the region than a survey of the California-Nevada border. It was unique in that three camels were used as part of the pack train (Wheat 1939b: 205). After exploring the valley floor for several days and determining that parts of the sink were below sea level, the expedition ascended Emigrant Wash, missed the mouth of Emigrant Canyon and traveled up Jayhawker Canyon as the Jayhawkers had done in 1849 (Levy 1969: 58). They also descended to Emigrant Canyon, went up the wash, across Harrisburg Flats and through Emigrant Pass to White Sage Flat, so that they were in or near the project area the entire time (Fig. 1). They crossed White Sage Flat, stopped at a spring they called Mesquite Spring, then continued down into Panamint Valley and into the Coso Range, scaring Indians, whites and animals alike with their camels. The identity of Mesquite Spring is not known, making it unclear whether they went down Nemo Canyon or crossed to Wildrose Canyon at some point. The original documents have been lost, so the account of the survey is based on various newspaper stories (Levy 1969: 58, footnote 5). The California Geological Survey (Whitney 1865: 462) apparently used a map and manuscript report of this survey as the basis for its description of that area.

The army, based at Camp Independence, sent scouting parties into the area. The earliest recorded reconnaissance was in April 1867, when 1st Lt. Charles Bendire was ordered to scout east of the post to the Amargosa River, by way of Coso and Emigrant Canyon (Levy 1969: 87). The earliest known scouting map, dated 187[illegible], shows that one of the two routes into Death Valley was across the Panamints (Levy 1969: Illustration 1). Levy (1969: 88) believes this route was through Wildrose Canyon and then across to Trail Canyon. However, the path of the trail and position of the mountains on the map appear to indicate that the trail approximated the route of the present road, going up Wildrose Canyon, across Harrisburg Flats, down Emigrant Canyon, and then down the broad alluvial fan of Emigrant Wash. Scouting maps made in 1875 show trails to "Rose" Spring. One appears to show the Death Valley route up Wildrose Canyon and down Trail Canyon (Levy 1969: Illustration 2), while another shows a wagon road leading to Emigrant Spring (Levy 1969: Illustration 3). A third (Levy 1969: Illustration 4) shows both.

The Wildrose/Trail Canyon route into the valley seems to have been pioneered by the Miller-"Rhodes" Party of 1869 (Wheat 1939b: 212-213). "W. H. Rhodes" seems to have been W. B. Roods, the 1849 Jayhawker who left his initials at Jayhawker Spring. The party was looking for the Gunsight Lead. This route appears to have been followed by the Wheeler Survey in 1871, one of the first of the massive Geographical Surveys West of the One Hundrodth Meridian, which lasted throughout the 1870s. Part of the expedition, under Lieutenant Lyle, camped at "Rose" Spring, described as being 7 or 8 mi up "Rose" Canyon, near the head of the canyon where there was an open plateau with grass and wood. This could describe Wildrose Spring or any of the springs near the Wildrose residential area, although the former is only 2½ mi up the canyon and the latter are 4 to 5 mi up. Lyle's party, joined by Wheeler's group, crossed the crest into "Death Valley" Canyon, which, according to Levy (1969: 81-82), probably is Trail Canyon.

Based on this information, it seems that the general project area was a part of one of the most used early access routes to and from Death Valley. The Wildrose Canyon area also was an early focus of mining activity, although the prospects probably were not very fruitful; none of the early expeditions describe them in any detail (Levy 1969: 96).

Wheeler's 1871 map shows the Telescope Mining District and two others--Death Valley and Lyon--in the Panamints. A second reconnaissance, by Lt. Rogers Birnie in 1875, describes a Rose Spring District. It was bounded on the north by Cottonwood Canyon and on the south by Rose Spring Canyon, which presumably is Wildrose Canyon. By 1883 the area was known as the Wild Rose District, and numerous mines were producing antimony and silver ore (Mattes and Simmonds 1970: 19-20; Preston 1974: 26-27).

Mining activities were developing throughout Inyo County in the 1870s. The Modoc Mine in the Lookout District of the Argus Range across Panamint Valley looked to the Wildrose Canyon area as a source of charcoal for its two smelters. By late 1876 charcoal apparently was being burned in pits in upper Wildrose Canyon; by May 1877 the 10 charcoal kilns in Wildrose Canyon had been built and were connected to the Modoc Mine by a road through Wildrose Canyon and across Panamint Valley (Mattes and Simmonds 1970: 30-31). The charcoal kilns continued in operation only until 1879 (Mattes and Simmonds 1970: 39-40), and there is no evidence that they were used by other mining interests. They were reconstructed by CCC labor in the mid-1930s and were the subject of prestabilization archeological investigation in 1971 (Wallace 1971). Though the kilns are 7 mi up canyon from the project area, they are significant to the present study because they were responsible for the first documented road building in the area.

Borax mining is an integral part of the history of Death Valley, but it is the only era not reliably represented in the project area. Borate minerals were first noted in the valley in 1873 (Teague and Shenk 1977: 36), but they were not exploited until 1881 when Isadore Daunet formed Eagle Borax Company. The operations at Eagle Borax Works lasted only until 1884, owing to continual financial losses (Levy 1969: 124). By late 1883 Harmony Borax Works was in operation near Furnace Creek. The biggest problem faced by these companies, along with most other mining ventures in the region, was transportation. The nearest railroad was 165 mi away at Mohave. For the ventures to be profitable, large amounts of borax had to be transported. The 20-mule teams, which operated from 1883 to 1890, were developed to solve this problem and made Death Valley famous (Levy 1969: 134). The route of the 20-mule teams was south down the length of the valley and out through Windy Gap. Because it was easier to go around the Panamints than through them, the project area played no part in the borax mining industry.

However, the Panamints continued to attract prospectors, and the Wildrose-Emigrant area seems to have been a major avenue mmunication and transportation. A map of the Death Valley area from C. Hart

Merriam's Death Valley Expedition of 1891 shows a well established route fairly close to that of the present day road (Levy 1969: Illustration No. 5). Members of this expedition visited the project area, naming Harrisburg Flats Perognathus Flat (Jaeger 1975: 15). They also noted petroglyphs in Emigrant Canyon and wrote the earliest accounts of the local Shoshone.

The turn of the century ushered in the next mining boom in the region. Gold was discovered at a number of places and thousands flocked to boom towns such as Goldfield and Rhyolite (Levy 1969: 141). On the east side of Panamint Valley, Ballarat flourished and supplied the needs of numerous mines and prospectors in the area. In 1905, while crossing Harrisburg Flats on their way to Ballarat for the 4th of July celebrations, Pete Aguerreberry and Frank "Shorty" Harris discovered gold, which led to the founding of Harrisburg on the east side of Harrisburg Flats (Hubbard, Bray and Pipkin 1965: 67-68).

Skidoo was founded in the hills 8 mi north of Harrisburg in 1906 after gold was found by Harry Ramsey and "One-Eye" Thompson while on their way to Harrisburg (Levy 1969: 151; Koenig 1971: 3). Skidoo quickly outgrew both Harrisburg and Ballarat. It had a bank, a newspaper, stage and freight service to Rhyolite and Ballarat, telephone service to Rhyolite, and a pipeline carrying water from Telescope Peak (Norwood and Bull 1978: 1940). A 1907 map of the Skidoo-Wildrose area (Koenig 1971: 9) shows that the stage road to Ballarat closely approximated the present route through Wildrose Canyon and Rattlesnake Gulch before turning up White Sage Wash and across White Sage Flat, returning to the modern route at Emigrant Pass. The original route across White Sage Flat is shown as a light-duty improved road on the USGS topographic map (Emigrant Canyon 15').

This map identifies a spring near the Wildrose residential area as Kenedy (Henedy?) Spring. The name Kennedy was also associated with a mine on a 1902 Inyo County mining map (Mattes and Simmonds 1970: Illustration 2) and the Kennedy-Grundy residence, which was about ½ mi up from the Wildrose Stage Station (Hubbard, Bray and Pipkin 1965: 88). They may be named for W. L. Kennedy or his family. He is known to have been a recorder for the Wildrose Mining District in the early 1870s. A Frank Kennedy, identified as a longtime resident and miner in the Panamints, was mentioned by Frederick Coville (1892: 354).

Spring Stage Station is also located in Wildrose Canyon on this map. It is supposed to have been where Wildrose Station (now a day-use area) was later located, ¼ mi from the Kennedy-Grundy place (Hubbard, Bray and Pipkin 1965: 88). Levy (1969: 165) states that the only remaining feature of the stage station is a smoke-blackened rockshelter, formerly the blacksmith shop.

The boom was short-lived; a financial panic in 1907 radically slowed Skidoo's growth (Norwood and Bull 1978: 140). Both Skidoo and Harrisburg began to decline. By the end of World War I, the Skidoo mines were closed, the pipeline had been salvaged for its metal, and the sole resident of Harrisburg was Pete Aguerreberry, who worked his mine for 36 years more (Norwood and Bull 1978: 144). The area still had many prospectors and claims and enjoyed brief resurgences of activity through the years. Antimony was mined and refined in Wildrose Canyon in 1914-15 (Tweed 1976: 319). Journigan's Mill just north of the project area was built in the 1930s to process gold ore being mined in the area. Skidoo was also briefly revived in the 1930s (Koenig 1971: 8).

Death Valley National Monument was established in 1933. To escape the summer heat of the valley, the summer headquarters was located in Wildrose Canyon, the area now known as the Wildrose residential area. A Civilian Conservation Corps camp was established there on what is now the Wildrose Campground. Wildrose Station was a gas station with a small store, restaurant and motel units on the old Ballarat Road. It was granted a concession license in 1937 (DVNM files). It had served as a gas station for some time prior to this. All structures in this area, except a restroom, were razed in the early 1970s; it now is used as a day-use picnic area, the various foundations and floors sporting picnic tables.

The history of the present road is somewhat vague. When its present route was decided upon and when it was paved are unknown, but both had been accomplished by 1938, by that time there were suggestions for altering the route, including one that would have restored the 1907 route through White Sage Flat (DVNM files). It also is unknown how far the road was paved, because the paved highway through Panamint Valley was not built until 1949.

While mining has declined since the 1930s, the region retains its value as a transportaton route and as a scenic recreation area.

Chapter 4

SURVEY REQUIREMENTS AND METHODS

Proposed Road Work

The present Emigrant-Wildrose Road, Route 8, seems to have been constructed in the 1930s. Since that time, attempts have been made to improve the existing route or to reroute entire sections. This is because the road is of poor quality; it is narrow (18-19 ft wide) and has a number of tight (both in width and radius), dangerous turns. Road shoulders on hillsides and steep canyons are narrow or nonexistent. Drainage is extremely poor. Through Rattlesnake Gulch the road is the canyon floor, and thus acts as the drainage. This problem of drainage also is apparent in Wildrose Canyon.

To alleviate these problems, the National Park Service is reconstructing 18.1 mi of this road, which is the subject of this survey. The northern 6.4 mi, from just below Journigans Mill to Emigrant Pass, will be widened to 22 ft and resurfaced, with some shoulder and ditch rehabilitation. No realignment of the road is contemplated. The 11.7 mi of road south of Emigrant Pass runs along the hills above White Sage Flat, passing over the Nemo Crest, and descends through Rattlesnake Gulch and Wildrose Canyon to the park boundary. This section will also be widened to 22 ft and will have 2-ft shoulders. The only exception to this will be through the Rattlesnake Gulch section. Because of the narrowness of the canyon, the road will be paved at variable widths from canyon wall to canyon wall to achieve as safe a width as possible. To control drainage, this section will have bituminous curbs. A number of realignments of the road are scheduled for this part of the road. These include the alteration of a number of curves near Nemo Crest to a minimum 150-ft radius, realignment and elevation of grade to reduce the effects of flash floods, a redesigning of the hairpin at the upper end of Wildrose Canyon, and alteration of the intersection there from a "Y" to a "T". Considerable work on the drainage system in Wildrose Canyon also will be done. The borrow site for this project will be at the north end of the project in the bottom of Emigrant Wash, across the road from Journigans Mill.

To comply with numerous federal regulations safeguarding the nation's cultural heritage, this study was conducted to identify the cultural resources of the area, to determine what effect road reconstruction might have on them, and to determine how the effects could be avoided or minimized. To satisfy these requirements, an intensive survey of the entire length of the project was conducted. To ensure that alterations of the proposed road design would not necessitate further fieldwork and to help place any located sites in a broader physical and archeological context, a 1/8-mi survey corridor was used. The road was used as the centerline for this corridor, and a 100-m strip on either side of the road was to be examined. As often is the case, this survey strategy was modified somewhat in the field, owing to physical limitations.

Actually surveyed territory may be considered to be 100 m on either side of the Emigrant-Wildrose Road, from the park boundary north 18.1 mi, with the following exceptions. Because of the steepness of the canyon walls in Rattlesnake Gulch and Wildrose Canyon, only the canyon floor and other accessible areas were surveyed. In Rattlesnake Gulch, the road covers the entire canyon floor, so survey was limited to the disturbed road edge and the lower canyon wall. The floor and wash of Wildrose Canyon were inspected, as were the mouths of side canyons and any accessible flat benches protruding from the canyon wall. The road at the Wildrose hairpin, its intersection, and the road to the Wildrose residential area are scheduled for extensive work, but the proposed alterations have not been cast in final form. Here the canyon floor and wash were surveyed from the curve of the hairpin up the canyon to the side road for Wildrose Campground. The only other deviation from the 100-m limit was on the ridge crossed by the road on the south side of Nemo Canyon. The ridge west of the road was inspected up to a distance of approximately 250 m because a number of rockshelters on the south side of this ridge are visible from the road.

The object of an intensive survey is to examine as close to 100 percent of the project area as possible. To realize this goal in the time available, four archeologists walked zigzags in transects approximately 25 m apart. This meant the survey area on one side of the road could be covered to the required limit in one team transect. When a site was located or suspected, the crew members halted their transects and converged on the site to record it and to determine its extent. The terrain, in general, was not a hindrance and ground visibility was good. Most ground cover was low and widely spaced, exposing the surface between each bush. Twelve days, or 385 person-hours, were spent on the field survey, covering an area of 582 hectares (1,440 acres).

Research Design

Criticism of archeology's lack of scientific orientation, and in particular the lack of research in contract programs, has led in recent years to the development and use of explicit problem-oriented research designs to guide archeological research (Plog, Weide and Stewart 1977: 107; Binford 1972: 160). For a number of reasons, such a research design was not formulated prior to this study. Logistically, there was a lack of funds and a lack of time prior to the scheduled fieldwork. However, these were not the major factors. First, very little previous work has been done in the immediate project area or even in a similar upland environment. What little work has been done is either dated or has yielded generally negative results. This is not a good information base on which to construct hypotheses for testing. Therefore, one of the major goals of this survey is simply to establish the presence of sites and to gain some knowledge of site type and possible time depth of human occupation.

The most important factors are the problems inherent in attempting to devise a research design for a predetermined highway corridor. There are two major limitations to highway research: the linear sampling spaces imposed by the corridor, which arbitrarily dissect the natural resource gathering/use territory, and the human bias in the placement of highway routes (Goodyear 1977: 158). In long highway corridors, these effects can be minimized by the cross-cutting of several environmental zones (Plog, Weide and Stewart 1977: 109); while not allowing assessment of the distribution of sites in a region, the approach should demonstrate the variety of site types in the area (Trubowitz 1977: 148; Goodyear 1977: 159). The research potential of a small highway study is severely limited, providing mainly data on survey methods and site location information (Trubowitz 1977: 145).

The project area constitutes a linear sample of the Panamint Range.

A summary of our expectations going into the survey follows. Within the project area the sample will be 100 percent, avoiding the need for a project specific sampling design. The survey should provide a complete inventory of sites in the project area. Some of these sites will reflect the mining and transportation/communication uses known historically for the area. Prehistoric use of the area is not well known. Previous surveys have yielded little positive data on the desert scrub communities, but have documented use of the higher pinyon-juniper zone.

In the larger perspective of the regional environmental setting, this sample should provide new data on the human use of this modern environmental zone, the upland desert scrub setting. Data concerning the use of prehistoric upland environments, which has received little attention in the past, may also be obtained. In addition, hypotheses on which further work should be based can be generated.

Previously Known Sites

Two prehistoric and three historic sites were known for the area prior to this survey, although only one had been formally recorded. Wallace's Wildrose Canyon survey recorded one site, WR-44, as being within the present survey area (Wallace and Taylor 1955: 357-358 and Map 1). It was described as a lithic workshop. From the site form it appears the site was completely surface collected. Because of this and because the location decription and mapped location did not agree, it was felt that relocation would be difficult. The petroglyph site in Emigrant Canyon described by Mallery (1893: 61) and later mentioned and illustrated in a number of texts (Steward 1929: 82; Heizer and Baumhoff 1962: Fig. 29A; Heizer and Clewlow 1973: 97 and Fig. 52f, j) has been assigned California State No. 4-Iny-285, but no site form was available. Locational information was vague, so it was not known whether the site was within the survey area in Emigrant Canyon.

The day-use area in Wildrose Canyon, site of the 1930s gas station/motel and probably of the earlier stage station, was illustrated in Tweed's Cultural Resource Survey (1976: 316-318). Also mentioned in this overview was a "cave house," a shaft with a door and masonry wall, at Wildrose Spring (Tweed 1976: 315). No information concerning its background was available. Information about a historic grave near the hairpin in Wildrose Canyon was provided by Bruce Bessken, the District Ranger at Emigrant Ranger Station in Death Valley.

Site Recording

Sites within the Great Basin cultural area, with the exception of caves and rockshelters, generally are surface artifact scatters with minimum subsurface deposition. The extent of these scatters is variable, as are artifact densities. This does not minimize their significance, since consideration of all sites is necessary when investigating overall cultural systems, such as those for settlement and subsistence (Trubowitz 1977: 146). Because field identification of functional site types often is misleading (Craib 1978: 18), sites were recorded as descriptively as possible. Because of the nature of most Great Basin sites, such functional determinations are quite hazardous in a survey such as the present one. They require careful systematic analysis of both inter- and intra-site variations. These types of sites reflect the highly seasonal nature of most Great Basin groups. Extra time was spent in the field when an artifact was located to determine whether it was an isolated occurrence or part of a site, one which might be large with widely dispersed artifacts.

Site status determination was, for the most part, pragmatic. Generally, localities with 10 or fewer artifacts or isolated features with no diagnostic material were recorded as isolated artifacts (IA). Often while carefully inspecting an area to determine its status, a few artifacts would be found separated by a number of meters. These usually were recorded under one isolated artifact number. All isolated artifact locations were plotted on a USGS Emigrant Canyon 15' topographic map.

Locations determined to be sites were recorded as fully as possible on the appropriate site survey form (Appendix 1). Prehistoric and historic sites were recorded on separate forms. Separate forms were used for isolated artifacts and for petroglyph/pictograph features. In addition, each crew member kept notes of daily field activities. A piece of cut rebar with an aluminum cap inscribed with a site's field number and the date was placed at each site to aid in subsequent relocation; it also served as datum for the site map. Each map was drawn using a Brunton compass and a 50-m tape. Each site was located on the

Emigrant Canyon topographic map and, where possible, on project maps supplied by the Denver Service Center. In addition, a complete set of aerial photographs, taken in March 1976 from an altitude of 12,000 ft, were available for use; all sites were also located on these, allowing greater accuracy than the 15' map could provide.

Black-and-white and color photographs were taken at each site. These 35 mm prints and slides illustrate sites and their environmental settings, specific sections of sites, and individual features and artifacts. They greatly aid in relocating sites and as an additional reference source.

All sites were given field numbers prefixed by DEVA-79B, a system that allows the Park Service to identify park, year work was done, and whether it was the first, second or later job done that year. Similarly, all isolated artifacts received numbers prefixed by DEVA-79B-IA. Upon return from the field, copies of all site forms were sent to the California regional clearinghouse at the University of California, Riverside, where they were given official numbers in the California state numbering system. These official numbers will be used in this report.

No sampling was conducted at any site. However, a limited collection program was followed to secure possible diagnostic artifacts. If an artifact was collected from a site, its position was recorded and mapped. In the laboratory, these artifacts were catalogued and identified with the appropriate field site and artifact numbers. In addition, all portable isolated finds were collected and numbered. This has become a policy of the Western Archeological Center, since relocation in the field of such artifacts would be extremely difficult. Collected artifacts, photographs and all field records are housed at the Western Archeological Center in Tucson, Arizona.

A multiple resources National Register nomination, consisting of 13 prehistoric archeological districts in the Monument, has been initiated by the Western Archeological Center. Among these districts is the Upper Panamint Archeological District, which consists of the surveyed areas in Arcane Meadow and Wildrose Canyon. This will be expanded to include some of the area surveyed in the present study. New districts may also be nominated. Historic sites also are eligible for nomination, but they will be handled as part of a nomination to be made upon completion of the historic research project now being conducted by the Park Service. At present, the only property listed on the National Register of Historic Places near the project area is the townsite of Skidoo.

Chapter 5

SURVEY RESULTS

This survey recorded 15 sites and 25 isolated artifacts (Table 1, Fig. 4 and 5). Of the sites recorded, seven are prehistoric, three are historic with localized prehistoric components, four are purely historic, and one is a stone circle of unknown age. Fourteen of the isolated artifacts are individual or small clusters of flaked lithics, eight are historic cans or glass, and three are stone features of unknown age.

Harrisburg Flats

The north end of Harrisburg Flats and the top of Emigrant Canyon constitutes a focus of prehistoric activity (Fig. 4). Five prehistoric sites and eight isolated finds of 1 to 10 artifacts were found within about 3/4 mi of each other. The five sites (Iny-1002, 1003, 1005, 1006, 1007; see Fig. 6) are surface lithic scatters. In general, the artifact density compared to site extent is very low at these sites, but most contain localized areas of denser concentration. The major importance of these sites is their artifact assemblages. It must be remembered that with a survey of this type and the limited pragmatic collection policy, an "in-depth" examination and evaluation of the sites and their contents is impossible. The following discussion is based on what was recorded and collected at the sites, but most of the opinions and conclusions should be considered hypotheses to be tested.

All sites are on low bluffs west of Emigrant Wash. This placement may be sampling bias; the bluffs east of the wash were beyond the survey limits, but they also are much higher. Iny-1005, 1006 and 1007 are on the extreme north end of Harrisburg Flats, while Iny-1002 and 1003 are further north, overlooking Emigrant Canyon. Iny-1006 and 1007 may be two loci of one site; the present road separates them. The location would seem to be good for observing animal or human movement through the natural access of Emigrant Canyon and across Harrisburg Flats. The only water sources are the very intermittent Emigrant Wash and its tributary washes. The nearest active springs appear to be about 3 to 4 mi north down Emigrant Canyon.

The assemblage at Iny-1007 yielded a Silver Lake projectile point

Table 1: Recorded sites.

SITE NUMBER (Field Site Number)	GENERAL LOCATION	SITE TYPE AND MAIN FEATURES	PERIOD ASSOCIATION	ELEVATION	AREA (m^2)
Iny-1001-H (DEVA-79B-1)	Emigrant Canyon	Historic - Can and trash concentration, wooden posts, historic petroglyphs	Period V	4,500'	7,500
Iny-1002 (DEVA-79B-2)	Emigrant Canyon	Prehistoric - Diffuse lithic scatter of obsidian and basalt; possible stemmed point fragments	Period II	4,880'	1,800
Iny-1003 (DEVA-79B-3)	Emigrant Canyon	Prehistoric - Diffuse lithic scatter; obsidian, basalt, stemmed and notched points	Period II-III	4,880'	2,750
Iny-285 (DEVA-79B-4)	Emigrant Canyon	Prehistoric - Petroglyphs with abstract and representational motifs	Period III	4,787'	200
Iny-1004 (DEVA-79B-5)	Harrisburg Flats (North)	Historic - Two rectangular alignments (for tents?); can, glass, and ceramic trash concentration. Prehistoric - Small basalt lithic concentration	Period V and Unknown	5,180'	500 (Area of concentration: Total = 10,000)
Iny-1005 (DEVA-79B-6)	Harrisburg Flats (North)	Prehistoric - Diffuse lithic scatter; basalt, obsidian, and chalcedony, stemmed and notched points	Period II-III	4,880'	4,250

Table 1--Continued

SITE NUMBER (Field Site Number)	GENERAL LOCATION	SITE TYPE AND MAIN FEATURES	PERIOD ASSOCIATION	ELEVATION	AREA (m^2)
Iny-1006 (DEVA-79B-7)	Harrisburg Flats (North)	Prehistoric - Large lithic scatter with possible concentrated activity areas; basalt, obsidian, chalcedony, stemmed points present	Period II	4,880'	15,000
Iny-1007 (DEVA-79B-8)	Harrisburg Flats (North)	Prehistoric - Lithic scatter with small concentrated areas; basalt, obsidian, jasper, chalcedony; artifacts: Silver Lake point; keeled scrapers; crystal backed scraper	Period II	4,880'	9,900
Iny-1008 (DEVA-79B-9)	Ridge between "A" and Nemo Canyons	Prehistoric - Rockshelter, small midden in front; ground stone and ceramics present	Period IV-V	4,940'	264
Iny-1009 (DEVA-79B-10)	Wildrose Canyon	Historic - 1932 grave, small concentration of historic trash. Prehistoric - metate fragment	Period V	4,080'	750
Iny-1010 (DEVA-79B-11)	Wildrose Canyon	Historic - Two mining shafts; small adits, one with masonry wall; scattered historic trash; one earthen platform with masonry wall	Period V	3,600'	3,750

Table 1--Continued

SITE NUMBER (Field Site Number)	GENERAL LOCATION	SITE TYPE AND MAIN FEATURES	PERIOD ASSOCIATION	ELEVATION	AREA (m^2)
Iny-1011-H (DEVA-79B-12)	Wildrose Canyon	Historic - Concrete and wood foundations set into hill with nearby vats, probably mining related; scattered historic trash	Period V	4,090'	4,000
Iny-1012-H (DEVA-79B-13)	Wildrose Canyon	Historic - Site of Spring Stage Station and Wildrose gas stations; foundations remain	Period V	3,520'	6,250
Iny-1013-H (DEVA-79B-14)	Wildrose Canyon	Historic - Two earthen platforms and two concrete support pillars, function unknown	Period V	3,360'	400
Iny-1014-H (DEVA-79B-15)	Emigrant Canyon	Rock circle (2.8 m dia.) of unknown age, on narrow ridge; no associated artifacts	Unknown	4,550'	60

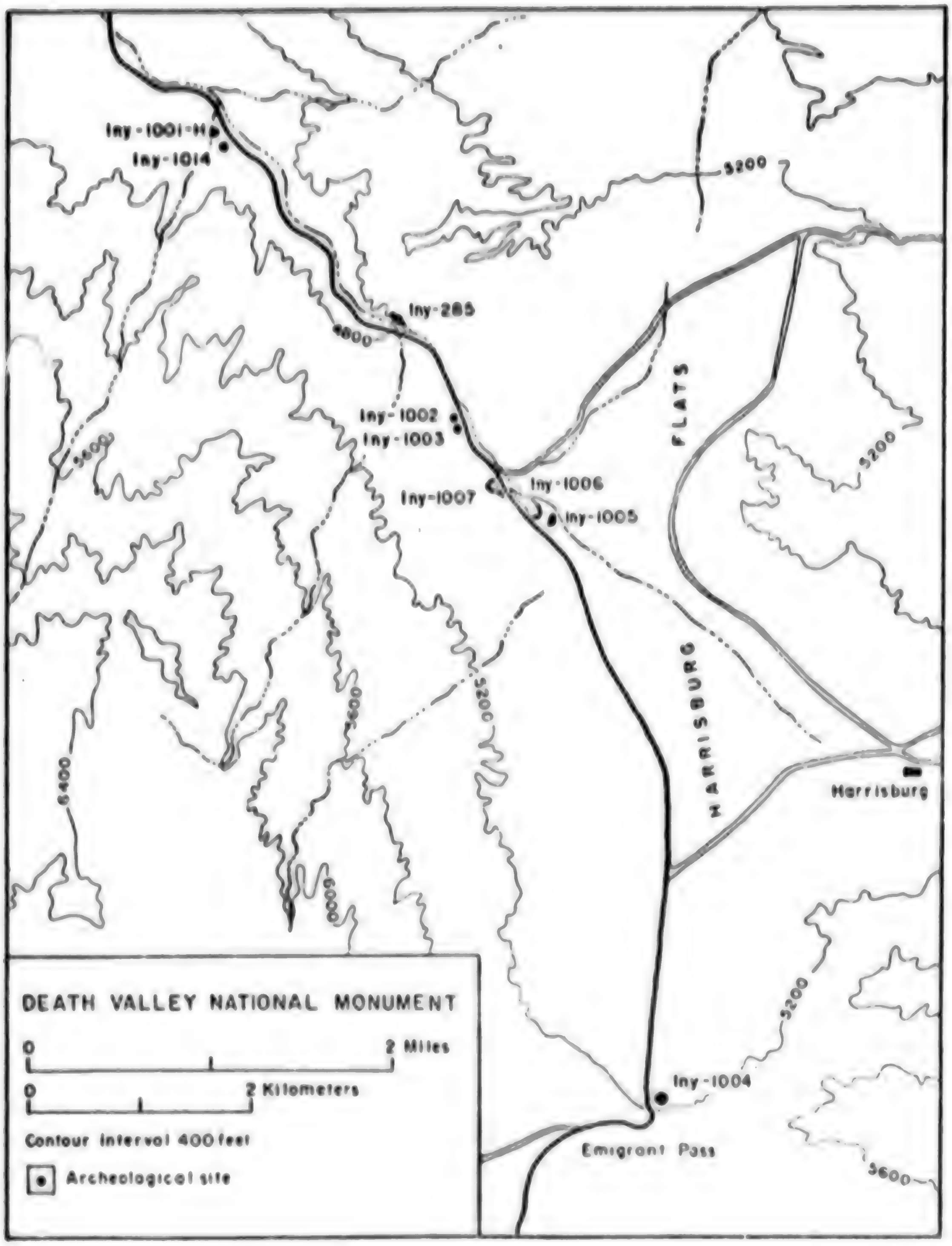

Fig. 4: Archeological sites recorded in the northern portion of the survey area.

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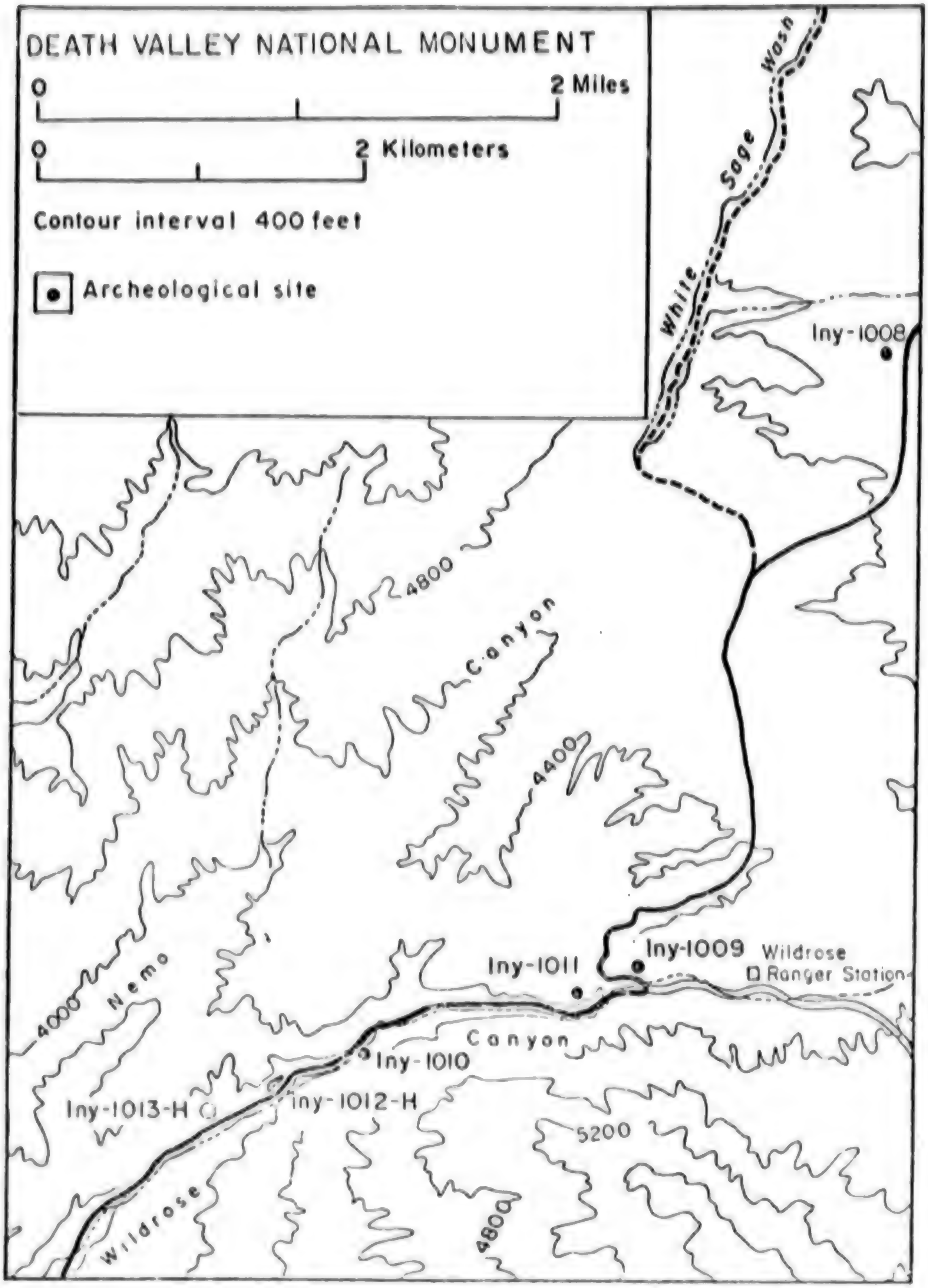

Fig. 5: Archeological sites recorded in the southern portion of the survey area.

Fig. 6: View south across Harrisburg Flats, with Emigrant-Wildrose Highway and Skidoo Turnoff in foreground. Site INY-1007 is on the low bluff to the right of the highway, site INY-1005 and 1006 to the left.

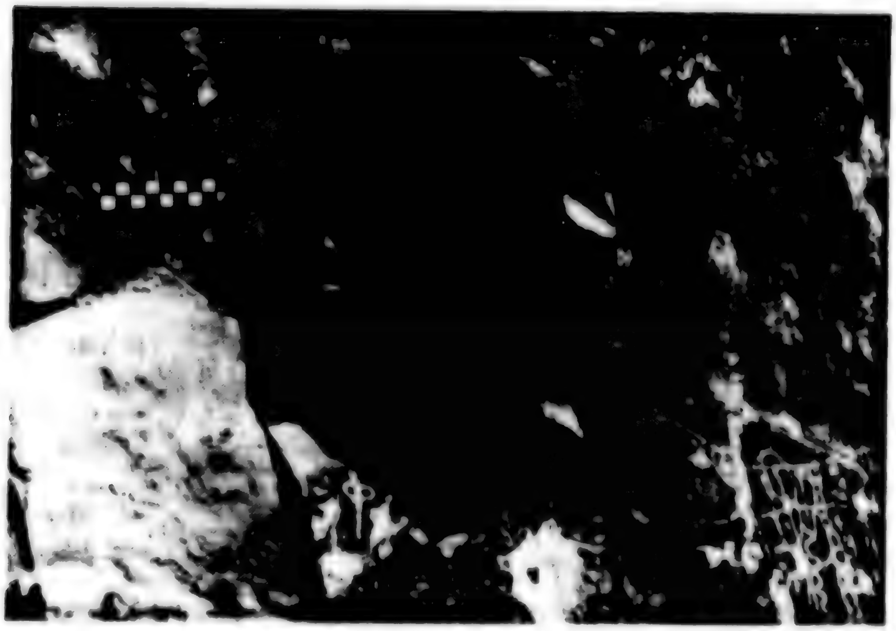

Fig. 7: The petroglyphs at site INY-285. Effaced historic inscription may be discerned at lower left.

of obsidian minus its tip (Fig. 8f). Other artifacts are similar to the Lake Mohave assemblage described by Amsden (1937). Some of these artifacts, including the Silver Lake point, were identified by Claude Warren and Margaret Lyneis at the University of Nevada, Las Vegas. Two round bifaces of chalcedony were found, as were two "keeled" scrapers of jasper (Amsden 1937: 61); one of each was collected. An anomalous point of basalt, again minus its tip, was collected (Fig. 8a). It is most reminiscent of Pinto types, but is not really identifiable with them (see Stanley, Page and Shutler 1970: 7, 26). A backed scraper of clear crystal also was collected. The site has a wide variety of lithic materials, basalt and obsidian being the most common.

The other sites and the isolated artifacts reflect the predominance of these two materials. Iny-1002 and 1003 yielded mainly obsidian, while Iny-1005 and 1006 artifacts are predominantly of basalt. The lithic component at Iny-1004 at the south end of Harrisburg Flats is almost all basalt. None of the sites has identifiable house depressions or stone features. Depressions were noted at Iny-1006, but closer inspection showed them to be burro wallows that were no longer being used. Active burro wallows were found throughout the project area, and all sites appear to have burro-caused disturbance.

Closer examination of the collected and recorded material from the other sites revealed more evidence of a Period II occupation, with an artifact assemblage similar to the Lake Mohave/Silver Lake type and to that described by Davis for the Panamint Basalt Industry (Davis, Brott and Weide 1969). Two long stem pieces of basalt from points or knives were collected (Iny-1005 and IA-13), and several others were noted (Fig. 8g, h). These are very similar to a large group illustrated by Tuohy (1969: 147, Fig. 2) from sites in western Nevada. A small stem end and a stem with shoulders, both of basalt, were collected at Iny-1006. The shouldered stem is similar to a Silver Lake base, but the cross-section is much thinner (Fig. 8i). A black quartzite fragment of a large scraper was collected at Iny-1005. Obsidian pieces collected at both Iny-1002 and 1003 might be from stemmed point bases, but they are too fragmentary to be identifiable (Fig. 8e). A small fragment of a jasper scraper almost identical to those at Iny-1007 was collected at Iny-1003. These artifacts are similar to those described and illustrated from a

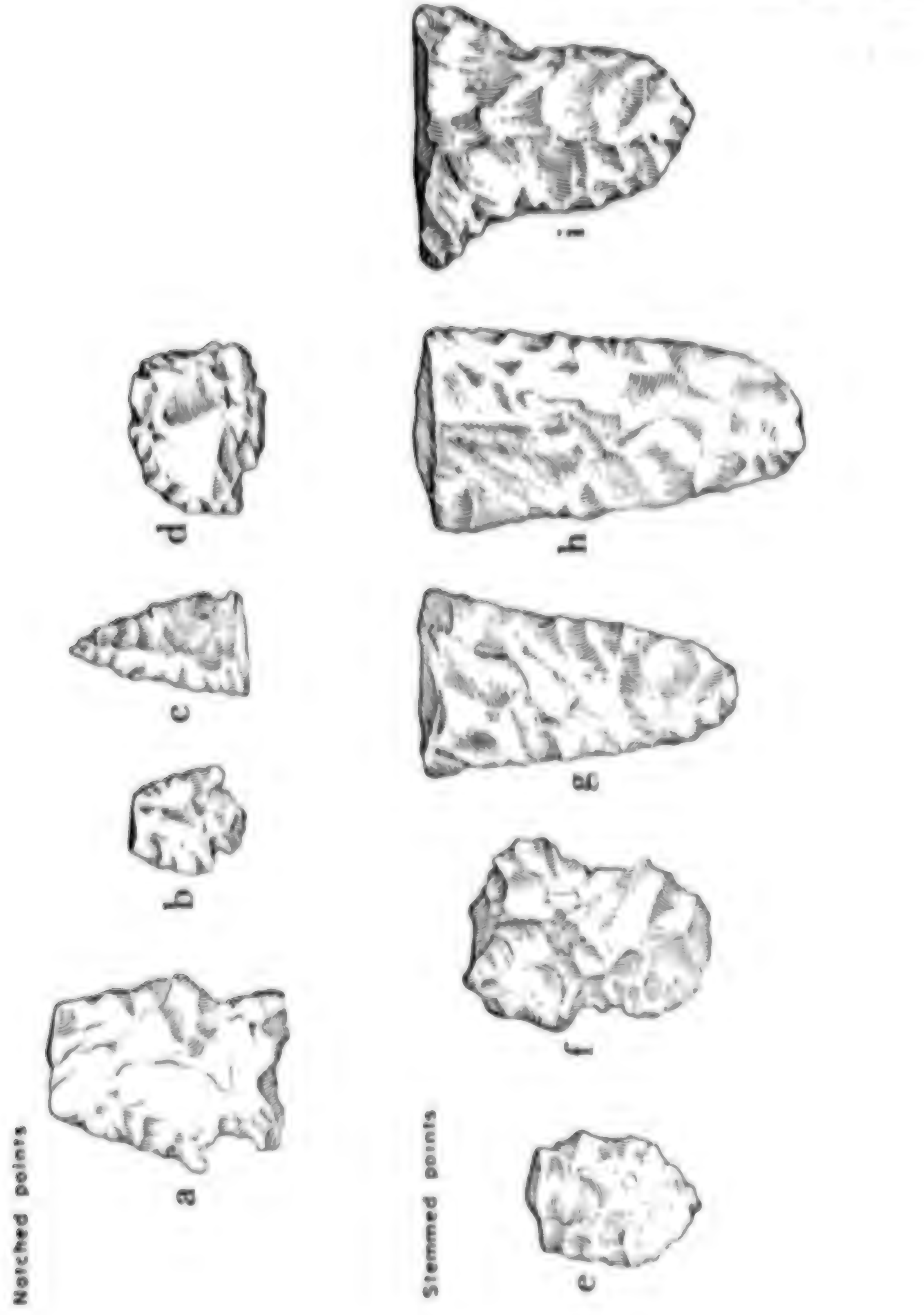

Fig. 8: Projectile points and possible point fragments recovered from the project area; identified and discussed in text.

wide variety of sites in western Nevada (Sadmat and Mud Lake in Tuohy 1969; the Coleman locality and others in Tuohy 1970) and in southeastern California (Panamint Valley in Davis, Brott and Weide 1969 and Davis 1970; Lake Mohave in Amsden 1937; San Dieguito assemblages in Brott 1966). All of these assemblages may be termed Early Period II. Dates usually claimed for these sites range from 6000 BC to 10,000 BC, with at least one claim (Tuohy 1970: 166) for the 30,000 to 11,000 BP range. Davis (1978b: 5) also suggests very early dates--15,000 to 10,000 BP--for Lake Mohave assemblages.

Though the information base is still quite small, some hypotheses may be generated to be tested by future investigation. These sites are very significant in terms of their Period II association and their geographic location. All of the sites previously associated with this period have been found in valleys near ancient lakeshores or now dry springs, with the exception of Davis' Hunter Mountain artifacts. These assemblages have been closely linked with the late Pleistocene-early Holocene lake systems, the Western Pluvial Lakes Tradition of Bedwell and Hester (Hester 1973: 62). This association may be spurious because it is based on a biased sample. Mountain ranges between these valleys and ancient lakes do not appear to have been examined. The sites found on this survey suggest that these areas may yield similar early sites independent of a valley lakeshore environment.

Sites all are located away from presently available water sources, suggesting that the climate may have supported a flow of water through Emigrant Wash when the sites were being occupied. This could be associated with conditions of the late Pleistocene-early Holocene (see discussion of past environment in Chapter 1), which may have a bearing on the pinyon exploitation hypothesis (Bettinger 1976, 1977a: 15) mentioned in that discussion. Bettinger's argument that pinyon exploitation began after AD 600 is based on work done in Owens Valley, but he suggests it may be applicable throughout eastern California. All identified pinyon camps occur within pinyon groves, and most contain late period projectile points and milling apparatus (Bettinger 1976: 86-88). These camps are similar to ethnographically known pinyon camps. What is not considered, however, is the possibility that the pinyon-juniper vegetational zone was at lower altitudes in the past or that earlier prehistoric groups used the pinyon-juniper resource area differently than did later groups. The Harrisburg Flats sites may indicate an early use of this zone while it was still present at lower altitudes, a use that may have differed from that of later groups.

The proximity of Panamint Valley to the area of Davis' Basalt Industry and the abundance of similar basalt material at the Harrisburg Flats sites suggests they may be related. Some survey was done during the Panamint Valley excavations near the summit of Hunter Mountain, where a small number of Paleo-Indian projectiles were found in high meadows (Davis 1970: 90). These basalt pieces were found at about 6000 ft and indicated to Davis (1970: 128) the use of all altitude ranges by early people. Whether these artifacts were isolated finds or from sites was not stated. Davis (1970: 122) also points out that while most tools were of basalt, all Silver Lake points recovered by her project were made of obsidian. The Harrisburg Flats sites reflect this, but the sample is very small and extremely biased. Whether the relationship between type and material is significant or due to sampling error is unknown.

Although there are a number of sites and scattered isolated artifacts, all sites appear to have little depth and there are no discernible midden areas. This may indicate repeated rather than continuous use of the area. An orientation toward tool use rather than tool manufacture also is indicated. No large quarry blanks, preforms or cores were found. The majority of flakes are retouched or worn. Most waste flakes are small. The sites may be associated with hunting, based on the projectile points. Fourteen artifacts have been identified as point fragments or possible fragments, but no whole points were found. Of the 14 pieces, 10 are broken leaving only the stem or the stem and the shoulders, three lack both tip and base, and one had lost its base. This sample suggests the discarding of broken projectile points and hafting complete ones, which could be a hunting camp activity. However, hunting may not have been the major activity focus, merely the one that left the best preserved tools. Seed and nut gathering may have been important. The possible presence of the pinyon-juniper zone and upper sagebrush community would provide pine nuts and numerous grass seeds for use. Milling implements are not a prerequisite for the use of these resources.

A hypothesis on the settlement/subsistence systems might also be generated. The possibility of repeated use suggests seasonal occupation of these sites. The relationship with lowland sites, such as those in Panamint Valley, suggests that some type of subsistence round using seasonally available resources of both lowland and upland areas may have been practiced. Such a subsistence pattern, while broadly similar to the ethnographic Shoshone pattern, may have differed greatly in resources used and the scheduling of time spent in the various areas.

The majority of the material from these sites and the absence of ground stone (or ceramics) suggests a Period II use of the area. However, there are three projectile point fragments that indicate the area might have been used during Period III (Fig. 8b, c, d). The identifications of these points are extremely tentative, since the diagnostic bases of all are broken or missing. Period III is suggested by a process of elimination. The points are small and/or show corner or side-notched bases, distinguishing them from the large stemmed or fluted Period II points. Yet they are too large for points associated with Period IV and the notching is different. The milling tradition that marks this period is not present, so it may represent a specialized use of the area.

Other Prehistoric Sites

Iny-285, the petroglyph site first noted by Mallery (1893: 61) and later illustrated in numerous texts, was within the project area and so was fully recorded by this survey (Fig. 7). The petroglyphs are found on a large exposed volcanic tuff in Emigrant Canyon. This cliff is a striking feature in the canyon and is the only large exposed rock face in the area. Both abstract and representational motifs are present. Rock art in eastern California generally is considered to be related to hunting and/or hunting magic (Heizer and Baumhoff 1962: 239; Norwood and Bull 1978: 38). Bighorn sheep and hunters, armed with spears and atlatls, are prominent features at this site. However, two seed beaters also appear to be represented.

Great Basin petroglyphs are dated from 1000 BC to AD 1500 (Heizer and Baumhoff 1962: 233-234; Heizer and Clewlow 1973: 25). Rock art in the Coso Range to the west has been studied in detail, and this work can be generalized for much of eastern California because of similarities in subject matter (Norwood and Bull 1978: 37). Rock art may be divided into three periods based on subject matter (particularly weapon technology), relative patination and erosion (Grant, Baird and Pringle 1968: 68). The petroglyphs at Iny-285 date to the early period, based on the representations of bighorn sheep with both horns over their backs, hunters with atlatls and spears, stylized atlatl motifs, and the absence of bow and arrow. This early period is dated approximately 1000 BC to 200 BC (Grant, Baird and Pringle 1968: 25), which would place the site in Period III. There is little superimposition of elements, but differential weathering suggests the site was added to over a period of time. In addition to the prehistoric elements, there was some historic graffiti, mainly people's names and dates. Many of these historic elements appear to have been purposely effaced by pecking over them.

The only site with artifacts indicating Period IV use in the project area was the rockshelter Iny-1008. The ceramic horizon marks the beginning of the Period IV construct (Norwood and Bull 1978: 68), and this site yielded three potsherds, all Owens Valley Brownware. This rockshelter is the largest of a number of obvious shelters on the ridge south of Nemo Canyon (Fig. 9). A small midden is eroding down the slope in front of the shelter, which contains fire-affected rock and a smoke-blackened ceiling. The artifact assemblage of Iny-1008 is readily distinguishable from that of the sites in Harrisburg Flats, not only because of the presence of pottery and ground stone, but also because of the types of lithic materials used. Of 15 flakes found, 10 are coarse grained quartzite, which was extremely rare at the other sites, and none showed any use. The site may have been occupied in Period V (after contact), since a broken glass marble was found near the edge of the site. Whether this was left by native occupants of the site or by later Euro-American visitors could not be determined. The site may have been occupied periodically by small groups as they gathered the summer grasses of White Sage Flat and the nearby canyon floor, or by groups on their way to or from the pinyon-juniper zone in the fall, or both.

A rock circle, first recorded as IA-2 and then more fully recorded as Iny-1014, was found on a narrow ridge at the north end of the project area in Emigrant Canyon, overlooking the historic site Iny-1001-H. It

Fig. 9: View is northeast to site INY-1008, with Emigrant-Wildrose Highway and Nemo Canyon in background. The rockshelter is 1.8 m high and 2.9 m deep.

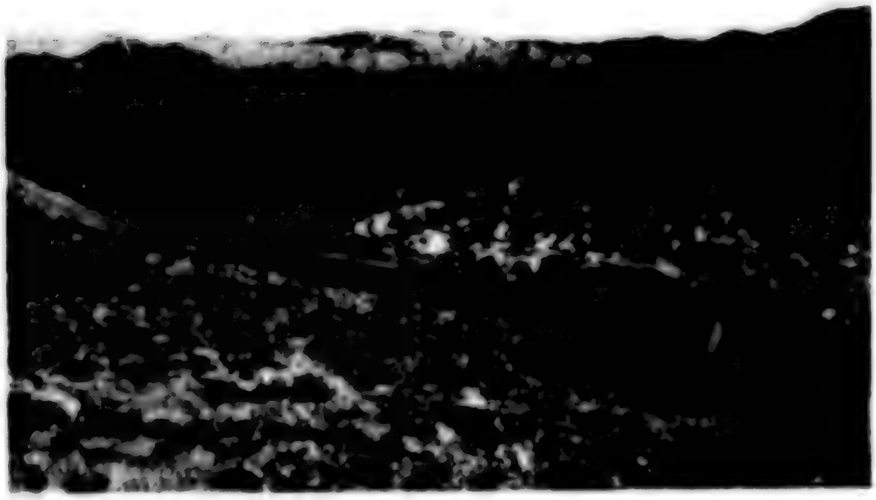

Fig. 10: View is northeast across Harrisburg Flats. Site INY-1004 is at center of photo, just beyond the highway.

is composed of a single set of stones, which are well embedded in the surface. No diagnostic materials are associated, so that its age and affiliation are uncertain.

Historic Sites

Three sites (Iny-1001-H, 1004 and 1009) have both historic and prehistoric components. All have concentrations of trash dating from the early 1900s to fairly recent times. Iny-1001-H yielded a single obsidian biface fragment, and Iny-1009 a fragment of a metate. Iny-1004 has a dense can and glass concentration, and about 12 m east is a small lithic scatter composed mainly of basalt waste flakes.

Iny-1004 (Fig. 10) also contains a number of features. A fairly well defined dirt road runs northeast through the site, and a very overgrown roadbed with stone and earth embankments is east of the trash concentration on a hillside. Two rectangular rock alignments also are present. Both are squares; the one near the present highway is composed of numerous small stones, the other (about 65 m east) of larger single stones. These alignments suggest some possibilities. They may have been the bases surrounding some type of house/tent or some other temporary structure. Harrisburg, about a mile to the northeast, was composed mainly of tents during its 1905-06 boom period. Iny-1004 may have been the habitation area for a claim in the nearby hills. Other hypotheses might also be advanced. The site is at the natural southern access to Harrisburg Flats. The first road passed through here. The original road continued north along the west side of the Flats, bypassing Harrisburg and Skidoo. A 1907 map of the area (Koenig 1971: 9) shows a road junction at or near Iny-1004, the road to Rhyolite continuing north and the road to Harrisburg angling northeast. The dirt road noted may be the Harrisburg road. This site could be some type of a stage or freight station. There is no known historic literature available to test this.

The original road north across the Flats originally was thought to have been the same route as the present road. This is not the case. The original roadbed, now overgrown, was discovered about 100 m east of the modern road, paralleling it for much of its length in the central and northern parts of Harrisburg Flats. A benchmark, placed in 1907, was found beside this roadbed. It is still marked on the Emigrant Canyon topographic map (BM 4896).

The main feature of Iny-1009 is a grave. The grave is outlined with stone but is not identified. There is no headstone or cross. Information supplied by the district ranger, Bruce Bessken, indicates the grave is Ed McSperrin's. He lived across the road near the cottonwood trees and the spring there, inside what is now the road hairpin in Wildrose Canyon. McSperrin was murdered on July 17, 1932, reputedly by Jimmy Madden (alias Jimmy Clebourne). Madden turned himself over to the Inyo County sheriff, but a Superior Court jury acquitted him after 72 hours of deliberation. He later died in San Quentin after being convicted of another murder. No evidence of McSperrin's living quarters was found, but this may be due to the amount of vegetation covering much of the spring area and the extreme disturbance of all open areas by burros.

A puzzling feature was encountered at Iny-1001-H. On the slope of the small ridge just northeast of the historic trash concentration are two small boulders with shallow pecked petroglyphs on them. A flat-topped boulder has the phrase "Well this looks likethe Stockya rds [sic]" on it, while a smaller boulder downslope has an "R" pecked on the side. These petroglyphs could have been made by anyone of the hundreds of prospectors and adventurers that have passed through this canyon, but why someone would have taken the time required to peck that phrase into the rock can only be speculated on at present. The possible significance of the "R" is interesting. Iny-1001-H is just south of Journigan's Mill, in the area postulated by Wheat (1939a: 90) to be where the 1849 Jayhawker group entered Emigrant Canyon after crossing from Jayhawker Canyon. Their presence at Jayhawker Spring was determined by the initials WBR and the date 1849 on a boulder nearby, placed there by William B. Roods, one of the Jayhawkers. Roods also carved his last name on a boulder in the gravel fan of Emigrant Wash near the mouth of Lemoigne Canyon (Wheat 1939b: 216, note 27). Could the "R" at Iny-1001-H have been placed there by Roods? This possibility might be tested by comparing how the various petroglyphs were made, the style of lettering, and whether there is any great difference in the weathering of the petroglyphs. This last may be unsuitable, if the stone used weathers differently. These tests could not firmly establish that this "R" dates to 1849 and the Jayhawkers, but could eliminate that possibility or increase its likelihood.

Wildrose Canyon Historic Sites. The other four historic sites are located within Wildrose Canyon (Fig. 5). Two, Iny-1011-H and 1013-H, were previously unknown. The site of the Wildrose Stage Station and the later gas station/motel, now a day-use area, was recorded as Iny-1012-H. The "cavehouse" at Wildrose Spring and its associated features became Iny-1010.

Iny-1010 may be the site of the Kennedy-Grundy residence mentioned by Hubbard, Bray and Pipkin (1965: 88). As mentioned in the history section above, this residence was located about ¼ mi above the Wildrose Stage Station, which is about the distance from the day-use area to this site. Some historic debris, a flattened area with a stone retaining wall, and a small shaft into the northern canyon wall also were found at the site. The flattened area is very near the "cavehouse" and may have been used for a tent or some other structure, though the survey found no evidence to verify this. Research into the spring's history revealed that in the late 1930s, the Journigan brothers owned the mining claim to this area. They wanted to build a small resort, which would have been in competition with Wildrose Station. They had bought the claim, known as the Monday Mining Claim, from the Monday Mining Corporation several years before (DVNM files). Their purchase included buildings, water rights and mill site claims. Where these buildings and the mill site were was not specified. No further information on the Monday Mining Corporation or on the Journigans after their failure to get a concessionaire license is available.

Iny-1011-H was found along the old roadbed at the upper end of Wildrose Canyon. The old roadbed, rather than turning east into Wildrose Canyon from Rattlesnake Gulch and then turning back west by means of the hairpin turn, followed the north wall of Wildrose Canyon. Set into the side of the canyon wall is a large concrete foundation, with smaller raised platforms and wood plank retaining walls (Fig. 11). Above this, at the end of a small access road off the original road, is a vat of corrugated metal with a concrete floor. There are nails, glass, cans, etc. throughout the area. The site appears to have been used for some sort of mining activity. It was suggested (Linda Greene 1979: personal communication) that this may be the site of the experimental antimony concentrator used in the area in 1914-1915. The foundations photographed and identified as such in Tweed (1976: 319) may actually be the foundations of a radio relay station in Wildrose Canyon that was moved to Rogers Peak. Again, this should be considered a hypothesis to be tested by future research.

None of the members of the survey crew had experience in evaluating these mining remains. An historical archeologist with training in this area may be able to tell much more about the sites and their functions. This may be of help in evaluating site Iny-1013-H down canyon from the day use area. No information at all could be found on this site, and no one in the survey crew could even speculate on what the features might have been constructed for (Fig. 12).

Relocation of WR-44 and Ethnographic Sites

Given the amount of historic activity known for Wildrose Canyon and the number of historic sites found there, it should not be surprising that very little prehistoric material was found. The metate fragment from Iny-1009 and a possible striated ground stone fragment, IA-26, were the only prehistoric artifacts found within Wildrose Canyon. The site recorded by Wallace and Taylor (1955) as WR-44 was not relocated. This was not unexpected, since there was contradicting information regarding the site's location and the fact that Wallace may have completely surface collected the site.

What is surprising is the lack of evidence for the ethnographic site described by Steward, who states (1938: 84, 92) that Wildrose Spring was used by Panamint Valley dwelling Shoshone for a winter village and by Shoshone from Death Valley in the summer. The historic site at Wildrose Spring, Iny-1010, and the years of roadbuilding and mining activity in the narrow canyon may have destroyed all evidence of the ethnograhic occupation; however, there is another explanation.

The spring identified by Steward and others as Wildrose is placed by him at about 4,500 ft (Steward 1938: 84). The Wildrose Spring located on the Emigrant Canyon topographic map and on most earlier maps where a good location is identifiable is at about 3,600 ft. Steward

Fig. 11: Concrete foundations and wood retaining walls at site INY-1011-H in Wildrose Canyon.

Fig. 12: Two concrete pillars at site INY-1013-H in Wildrose Canyon.

(1938: 84) states that the winter camp's name was Su'^{u}navadu, from *su:vi*, meaning "willow," and *navadu*, meaning "flat." This name would be much more descriptive of one of the springs near the Wildrose ranger residential area; while there are willows at Wildrose Spring, it is located in a fairly narrow area of the canyon. The springs at the Wildrose hairpin have a dense concentration of willows, but are at about 4000 ft (the two ground stone fragments were found near here). The springs outside the project area at the Wildrose residential area and in the canyon above it are probably the best candidates for Steward's "Wildrose Spring." Willows are found here, and the canyon widens out appreciably. These springs are at about 4,200 ft to 4,350 ft. Our survey did not examine these springs. The area was included in Wallace and Taylor's (1955) survey of Wildrose Canyon. Two sites, WR-38 and WR-43, were found at the upper end of the residential area. WR-43 is identified as a campsite with flakes of jasper, chert, obsidian, a projectile point (type unidentified), potsherds and possible house circles. Site WR-38 is recorded as a workshop with jasper and chert flakes. Wallace lists the nearest water source as being "Wildrose Spring, ca ½ mi." If this spring corresponds to the one located near the sites on his map, it would be the spring shown on the topographic map above the residential area just as Wildrose Canyon widens out. This seems to be the most likely location of the Steward's ethnographic occupations. Interestingly, Wallace also identifies the spring near WR-44 as Wildrose Spring, which is the presently known Wildrose Spring in the middle of the canyon.

Chapter 6

RECOMMENDATIONS

The proposed road work is described in Chapter 4. The road in question is to be widened along its entire length from 18 or 19 ft to 22 ft, except in Rattlesnake Gulch. If the shoulders of the road are kept as wide as they are at present, this will mean at least 2 ft of ground on either side of the road will be directly affected by the shoulders for the widened road, more if the shoulders are made wider. The surrounding area may also be affected if vehicles are used off the road for construction purposes or parked in convenient areas. The areas of road realignment along the hills above White Sage Flat and in Wildrose Canyon will, of course, also be directly affected.

Some of the sites recorded by this survey will be adversely affected by the planned road work. The major areas of concern are the sites at the north end of Harrisburg Flats, particularly Iny-1006 and Iny-1007, Iny-1004 at the south end of Harrisburg Flats, and Iny-1009, the historic grave site near the hairpin in Wildrose Canyon. Of possible concern are the historic sites Iny-1010 and Iny-1013-H, should the road alignment be altered in those sections of the canyon.

The sites of major concern will all be affected by the proposed widening of the road, not by road realignments. In all cases the sites abut the existing road shoulders. Iny-1006 and Iny-1007 may have been one continuous lithic scatter until it was bisected by construction of the existing road. Iny-1004 may also have been disturbed by the 1930s construction work.

Period II Sites

New shoulders will destroy parts of the very significant lithic scatters at Iny-1006 and Iny-1007 (Fig. 13). As described in Chapter 5, Iny-1007 contains a Period II Lake Mohave/Silver Lake type of assemblage. Iny-1006 has a similar assemblage, as do the other sites in this area. They appear to be the first sites of this period recorded in this geographic situation, which is important because the lakeshore setting has always been considered a major part of this assemblage. Since the sites border both sides of the road, the alternative of doing all the

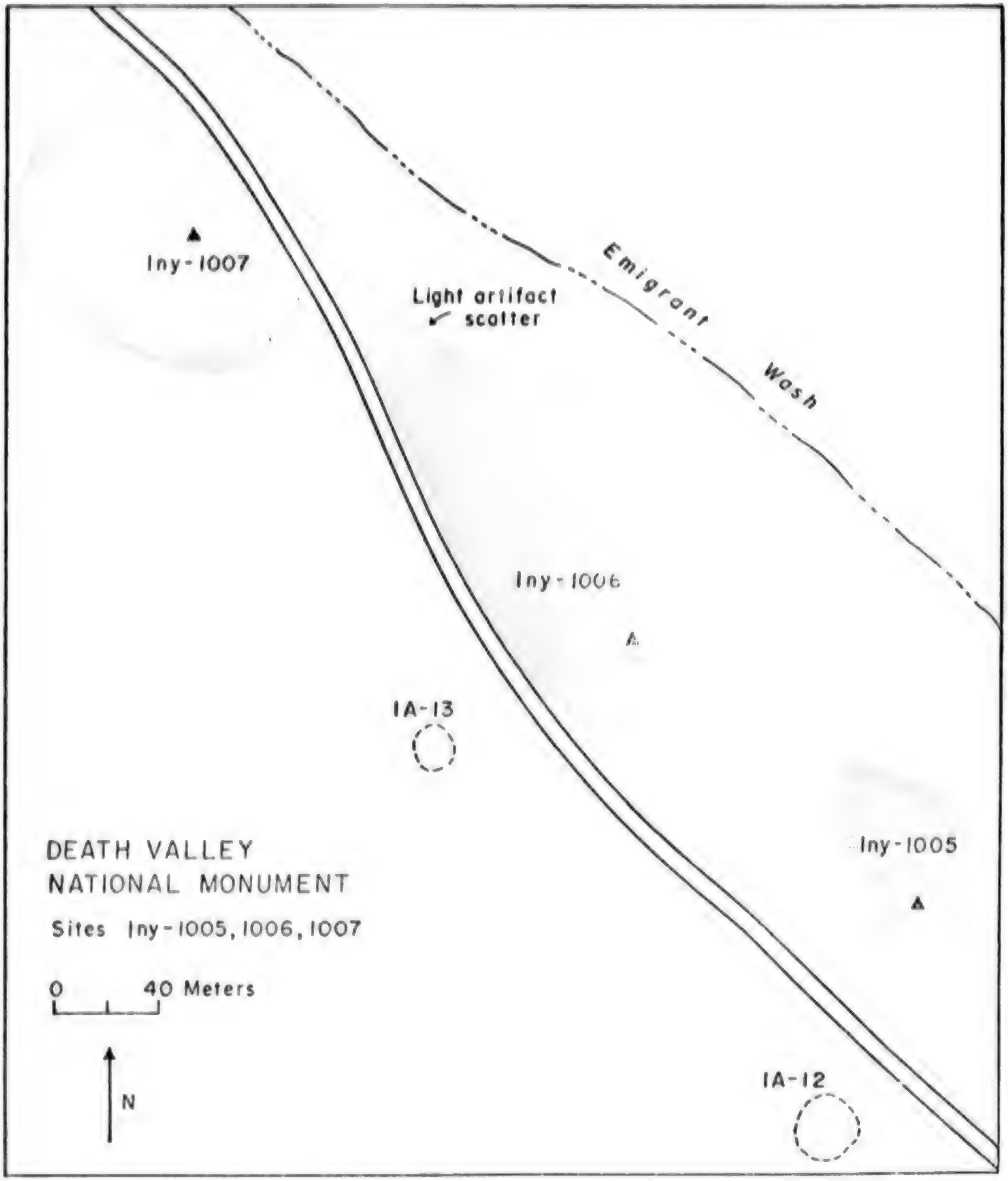

Fig. 13: Sites INY-1005, 1006 and 1007 in relation to highway.

widening to one side cannot be considered. There are a number of alternatives.

The best solution from both the road planning viewpoint and the cultural resources viewpoint would be to widen the paved part of the road without widening the shoulders, provided this could be done with no off-road disturbance during construction. The existing shoulders would probably need to be stabilized by asphalting so that later road maintenance would not inadvertently disturb the ground beyond these shoulders or curbs. Signs warning against pulling off the paved road in this area should be posted. This area of controlled shoulder width should extend from the intersection with the dirt road to Skidoo south at least 650 m (about 1800 ft) to provide a safe margin on the south side of Iny-1006.

If this is not feasible, there are two other alternatives. First, the entire section of road could be rerouted. This could be a project of major proportions. Whether the road was routed through Emigrant Wash east of the present route and east of Iny-1005 and Iny-1006 or west above Iny-1007, further archeological fieldwork would probably be necessary, because the new route would be beyond the present survey boundaries. The second alternative is to do no work on the existing road in this area. It would remain at its present width.

To implement the road work as planned is to affect one or both sites. If this is necessary, they will have to be excavated. An explicit research design to direct these investigations should be developed. It should include hypotheses for testing, possibly similar to those suggested in Chapter 5. The actual work should include a detailed site map, made with an alidade or transit, and a statistically determined sample of test units for excavation. An intensive surface collection may also be desirable and may identify specific activity areas. The entire site, or sites, must be sampled. In conjunction with these excavations, palynological studies should be done in an effort to analyze climatic change at this altitude. The basalt should also be analyzed to determine its source and its possible relationships with Panamint Valley.

Historic Site Iny-1004

Iny-1004 (Fig. 14), at the south end of Harrisburg Flats, will be

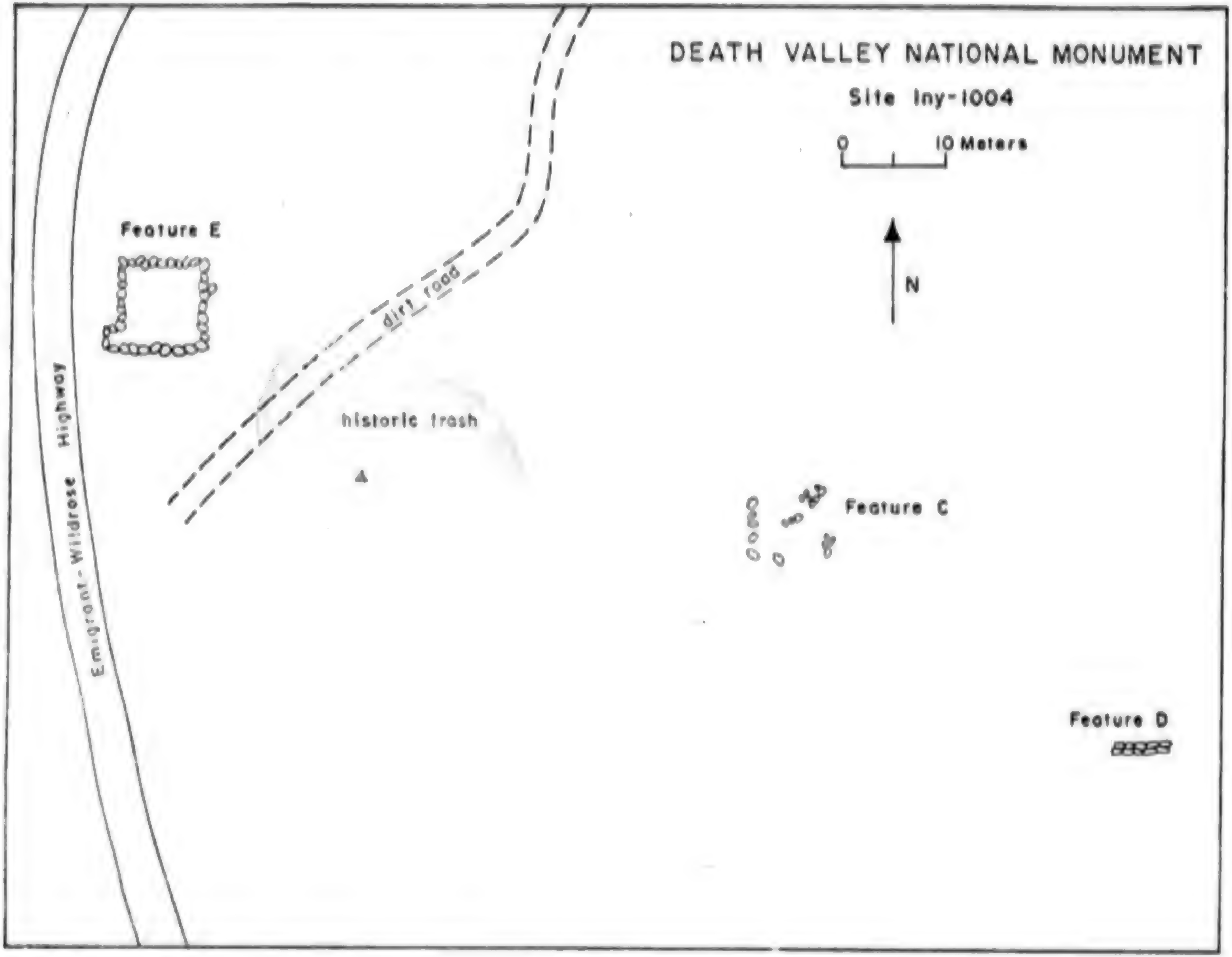

Fig. 14: Plan of site INY-1004.

adversely affected if the shoulder on the east side of the road is moved. The west wall of the rectangular rock alignment near the highway is 1 to 2 m from the existing shoulder. It will be impacted if this shoulder is moved. Since the west side of the road contains no cultural resources, any necessary widening could be done on the westside, taking care, of course, not to drive vehicles off road into Iny-1004.

Again, if disturbance is necessary a test excavation program, based on a planned research design, must be undertaken. An instrument map of the site should be made. A detailed historical study of the site should also be done. A number of hypotheses concerning this site are suggested in Chapter 5, and these might be used to direct the field research. Both rectangular alignments might be completely excavated to determine their functions. The final alternative of no work in this area may also be considered.

McSperrin Grave

The other site of major concern is Iny-1009 (Fig. 15), a trash concentration and the McSperrin grave near the hairpin curve at the upper end of Wildrose Canyon. The burial is within 2 m of the cut bank of the existing road shoulder. Any widening north of the present shoulder will disturb this burial. Widening may be done south of the road, since there is already a dirt turnout there. The no work alternative may also be considered in this area.

Since it is an historic burial, if it is to be disturbed an attempt should be made to locate McSperrin's relatives or descendants. They may have some wishes as to where the remains should be reinterred. The government should bear any expenses for a reasonable request. If no relatives are located, the remains should probably be reinterred somewhere nearby, preferably where no future disturbance will occur. It is doubtful that the site has any depth, but the site should be tested. A detailed map, noting surface concentrations, should be drawn using an alidade or transit.

Other Concerns

Widening should not affect the historic sites in Wildrose Canyon. Neither does it appear that the road will be realigned near Iny-1016 or

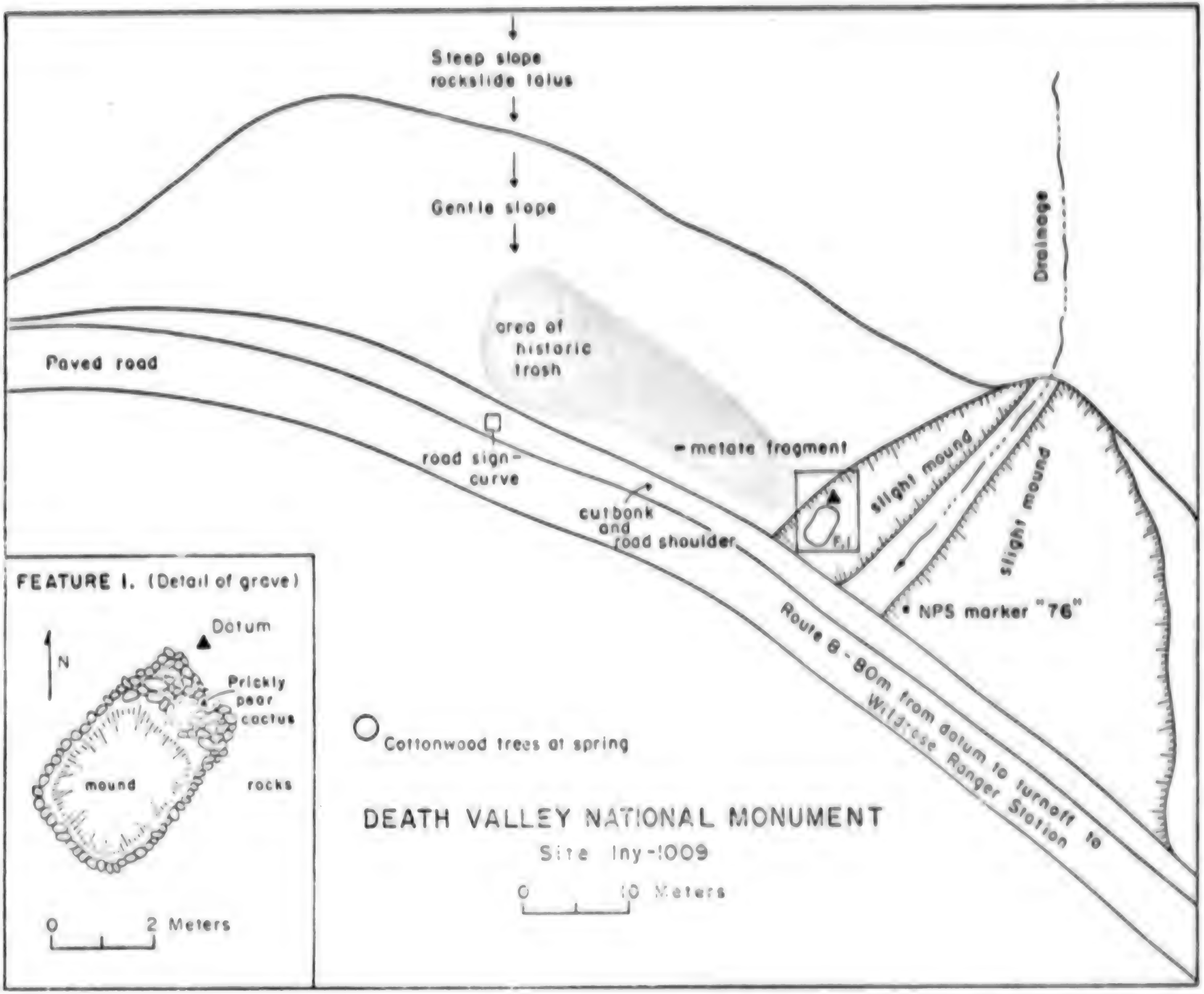

Fig. 15: Plan of site INY-1009

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Iny-1013-H. If realignment does occur in either of these locations, the sites should be examined by a historical archeologist familiar with mining to determine their possible functions and significance. Detailed historical research should also be done to determine what is known of them. Recommendations for further work should include the results of these investigations. A detailed alidade or transit map of each site should be drawn. The sites may be sampled if historical research fails to shed further light on them or if this research suggests that excavations would aid in the understanding of the sites. These sites are significant because they exemplify Wildrose Canyon's long history of mining.

The problem of feral burros in the Monument, particularly in the Panamints, has been noted by Park Service personnel. Steps are now being taken to remove the burros from the Monument, since they are not native (DOI 1977: 3). This will help to preserve the area's cultural resources. Disturbance by burros was noted at almost every site recorded in the present survey. This disturbance ranges from grazing and trails through the sites to burro "wallows," which destroy the surfaces of sites through creation of circular depressions 2 m or more in diameter. Should this removal progam prove ineffective, other steps may have to be taken to protect these sites.

Visitor use in the project area seems to be quite limited and impact on the cultural resources has been negligible. However, the reconstruction of the road may encourage increased visitor use. What effects this might have on the cultural resources is unknown, and so recommendations should not be made at this time. Three areas seem particularly vulnerable and should be inspected periodically to determine whether sites are being affected. The volcanic tuff bearing the petroglyphs of Iny-285 and the rockshelter Iny-1008 are easily seen from the road, which might encourage people to stop and explore. Iny-1006 and Iny-1007, at the north end of Harrisburg Flats, are near the parking area at the beginning of the dirt road to Skidoo. Again, people may want to explore the nearby land, which might be detrimental to the integrity of these sites.

One further recommendation must always be made for a project of this nature. Intensive surface examination cannot always detect the presence of a subsurface component. If archeological material is encountered during construction, all construction in this area should halt and a staff archeologist from the Western Archeological Center should be contacted.

Chapter 7

CONCLUSIONS

This survey examined an upland desert scrub setting in a mountain range between low basin valleys in the Great Basin, an environmental and geographical situation that has received little archeological attention. The limited previous work in the area indicated that little prehistoric material was present. Fifteen sites, both historic and prehistoric, were recorded. The historic sites were expected, since the region has been important historically. The rockshelter and petroglyph sites were not surprising since both site types have been found in the Panamints. What was surprising was the complex of sites at the north end of Harrisburg Flats and their early Period II association.

The temporal range spans a long period. Period II, with a time depth of 6000 BC to 9000 BC and possibly earlier, is represented at the Harrisburg Flats sites. The projectile point types at these sites suggest some Period III activity, and the petroglyphs may also date to this period. Period IV is definitely indicated at the rockshelter, although the occupation may have extended into the contact period, Period V. The historic sites with diagnostic material seem to date to the turn of the century and the early years of the 20th century. This long span of occupation has by no means been continuous.

Unfortunately, this sample cannot be considered representative of more than the areas actually surveyed. This is the consequence of performing small road corridor surveys without benefit of a regional research design on which to base hypotheses and research interests. The need for such a research design for Death Valley National Monument is paramount. From this, explicitly formulated research questions and hypotheses could be generated to provide direction for further projects. A systematic statistical sample of the entire Monument using this research design would be extremely valuable, but--given the finances and priorities of the Park Service--is unlikely. Formulation of a research design should be a major concern, because until then small surveys, such as this one and most others done in the Monument (Craib 1978: 95), can provide little more than site identification. Research areas that this design should include have been delineated by Craib (1978: 97-99) and will not be repeated here. However, some recommendations for further research, based specifically on the results of this survey, follow.

The discovery of Period II sites in this geographic setting and their significance has been discussed. These sites should be investigated further. A study of these sites should include excavation and further survey, both in the Harrisburg Flats area and in other upland environments. If possible, survey should include other mountain ranges, both in southeastern California and in western Nevada. As discussed in Chapter 5, several hypotheses may be explored.

The possible relationship between the Panamint Valley sites and the upland areas of both Hunter Mountain (Davis 1970) and Harrisburg Flats should be examined. In particular, the possibility that they represent different aspects of a seasonal subsistence cycle must be examined. Jennings (1964: 1974) maintains that the subsistence round known ethnographically has been essentially the same for the past 10,000 years. This has been questioned by many who feel environmental changes in the past have necessitated different adaptations, making models based on ethnographic groups very suspect (Norwood and Bull 1978: 82). A recent example of this use of ethnographic analogy in this area is a predictive model for the Owens Valley formulated by Bettinger (1977b). Davis (1978a: 12) suggests that even random samples of the modern environment may not be efficient in areas that have seen great environmental change. Based on her work at China Lake and other Pleistocene lakes, she suggests that any predictive work or sampling strategy should be based on a reconstruction of the past climate of the area. It may be that a seasonal cycle involving these sites was followed, but the cycles may have differed substantially from the ethnographic pattern.

It may be possible to test these proposals in Harrisburg Flats. Palynological studies could provide much information on the region's past climate. Botanical remains or animal bone recovered from the Harrisburg Flats sites might provide evidence of activities pursued there and the seasons at which they were occupied. The relationship of these sites to Panamint Valley could be further explored by analyzing the basalt to determine its source. The Panamint Valley quarries and basalt artifacts from sites there have been anaylzed (Davis, Brott and Weide 1969: 80-86) and provide a good basis for comparative work.

The examination of subsistence/settlement patterns of later groups requires further work in upland situations. While valley occupation sites are known from all periods in both Panamint and Death valleys, the proposed use of upland areas is in large part inferred from the ethnographic pattern. Use of the pinyon-juniper zone is verified at a number of sites (Wallace and Taylor 1955; Craib 1978: 82). The use of upland summer grasses and bushes is less certain; further examination of upland areas may clarify this use. Investigation of the rockshelter Iny-1008 may provide information regarding its occupants and their use of the surrounding area.

The efficacy of the pinyon exploitation hypothesis in the Death Valley area should be explored. As suggested in Chapter 5, the Harrisburg Flats sites may demonstrate an early use of the pinyon-juniper zone if it can be shown that this zone was at a lower elevation during that period. The present zone also seems to have been used prior to AD 600, based on Craib's (1978) work and Wallace and Taylor's (1955) survey in upper Wildrose Canyon. Craib (1978: 82) feels the area was seasonally inhabited "from at least the Elko period into the historic Shoshone period." Photographs of points collected by Wallace and Taylor during their survey include Elko series points and a possible Pinto series point.

The appearance of pinyon camps similar to ethnographic ones between AD 600 and AD 1000 (Bettinger 1977a: 15) may mark a fundamental alteration in the use of the zone, rather than the beginning of its use. The zone may have been exploited for resources other than pinyon nuts, or in addition to them. The nuts may not have been ground before consumption or the processing may have taken place elsewhere. The length of time spent in the zone may have been different, preventing the formation of the ethnographic type of pinyon camp. All of these possibilities should be examined.

The amount of obsidian present and the variety of types may lend themselves to the study of obsidian sources, which might reveal prehistoric patterns of economic exchange (Ericson 1977, 1978) through the region. While obsidian is not uncommon at sites in the Monument, the amount found at the Harrisburg Flats sites was not expected. In conjunction with examining the relationship between these sites and those in Panamint Valley, the use of obsidian should also be examined. Davis (1970: 122) feels that obsidian was used primarily in the manufacture of Silver Lake points during the Period II occupation of Panamint Valley. Obsidian at the Harrisburg sites seems to have been used for many purposes.

The historic sites found during this survey should not be ignored. As mentioned in the chapter on management concerns, an historical archeologist experienced in mining installations should inspect the sites, especially Iny-1011-H, the possible antimony concentrator site, and Iny-1013-H, of which nothing is known at present. The sites may not be recorded in written histories of the area, but longtime residents may know something about them. Oral histories of these "old-timers" should be done before this possible source of information is lost. Archeological investigation at these sites may provide information about their functions and roles in the area's development, and may reveal connections to historic sources not previously suspected.

The possibility that the petroglyph "R" at Iny-1001-H was placed there by the Jayhawker W. B. Roods should also be pursued. The possible courses of action are discussed in Chapter 5. This could provide one more verifiable link in tracing the earliest Euro-Americans through Death Valley.

The positive results of this survey expand our knowledge of what areas were used by prehistoric and historic peoples, and provide a good basis from which future research may be directed. This research can do much to explain human adaptation to Death Valley and the southwest Great Basin, and the cultural systems of the people who lived there, especially as regards settlement and subsistence. It is hoped that the National Park Service will be able to continue this archeological work and to avail itself of the research opportunities in this important region of the western United States.

APPENDIX I: Site Forms

Historic Site Survey Form
Western Archeological Center

Page 1 of 5

Project Name ____________ Field No. __________ Site No. __________

Previous Site Designation ______________________________

LOCATION

State ________ County ________ USGS Quad ____________________
T ________ R ________ Section ________, ________ ¼ ________ ¼
UTM Zone ____________ Easting ____________ Northing ____________
Ownership ________ Air Photo Reference ________ Elevation ________

Draw a map showing how to get to the site. Include roads, washes, and other prominent landmarks.

Describe briefly how to get to the site, mentioning roads, washes, and other prominent landmarks.

Description of site:

Area of site: ______ m²

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Historic Site Survey Form
Western Archeological Center
Field No. ______ __
Page 2 of 5

Site Type:
___ town
___ camp
___ homestead
___ industrial
___ mine
___ railroad
___ military
___ road
___ trail
___ graveyard
___ trash dump
___ other (specify)

Features:
___ structure
___ dugout
___ hearth
___ cairn
___ rock alignment
___ trash dump
___ R.R. grade (berm)
___ irrigation
___ trail
___ road
___ corral
___ burial
___ well
___ spring
___ tram (road/way)
___ tailings

Feature Description: (Construction techniques, materials, architecture types, extent of standing remains, size, etc.)

No. of Rooms ________________
Depth of Fill ________________

Activity:
___ industrial
___ domestic
___ military
___ ranching
___ homesteading
___ way station
___ mining
___ railroad

Other:

Present Condition:
___ unaltered
___ erosion
___ deposition
___ vandalized
___ grazed
___ chained
___ previously collected/excavated
___ damaged by construction
___ damaged by ORV

Describe disturbance and present use of area:

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Field No. ________
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Artifacts (all numbers are estimates):

Ceramic Types:
___ creamware
___ ironstone
___ crockery
___ porcelain
___ pearlware (shell edge, etc.)
___ transferwares
___ peasantware (banded, sponge root, polychrome floral)
___ glazed wares
___ other
___ whiteware
___ stoneware
___ number

Glass:
___ bottle, liquor
___ household
___ number
___ patent medicine
___ window
___ culinary
___ other

Metal:
___ food containers, utensils
___ horse and wagon
___ ammunition
___ domestic
___ hardware
___ industrial
___ personal
___ military
___ agriculture

Nails:
___ hand wrought
___ square cut
___ wire

Cans:
___ soldered seams
___ crimped seams

Smelting Refuse ________________

Bone ________________

Clothing and Personal Items (buttons, pipes) ________________

Miscellaneous (textiles, leather, paper, rubber, etc.)

Artifact Density and Distribution:

Time Period: ____________ Cultural Affiliation: ____________

Basis for Period and Affiliation Estimates:

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Historic Site Survey Form
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Field No. ________

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TOPOGRAPHY

___ alluvial fan
___ arroyo
___ bluff
___ canyon (floor)
___ canyon (side)
___ cliff
___ floodplain
___ hill
___ mesa
___ mountain
___ plateau
___ playa
___ ridge
___ rockshelter
___ slope
___ talus
___ terrace
___ valley
___ other:
(specify)

Gradient (in degrees) ________________ Exposure ________________

Discuss setting of site and description of terrain:

ARABLE LAND

Topographic Location(s) (floodplain, first bench, etc.) ____________
Distance from Site ____________ Direction from Site ____________
Site Soil:
___ clay
___ silt
___ sand
___ gravel
___ loam
___ other
___ desert pavement

WATER

Nearest Water (wash, spring, etc.) ________ Distance from Site ________
Permanent ________ Intermittent ________

Description of watershed:

VEGETATION

__________ Sagebrush scrub
__________ Shadscale scrub
__________ Creosotebush scrub
__________ Alkali sink
__________ Pinyon-Juniper woodland
__________ Joshua Tree woodland
__________ Barren
__________ Other (Specify)

Plant Species Present:

on near
__ ____ Creosote (*Larrea divaricata*)
__ ____ Bursage (*Franscria* spp.)
__ ____ Mohave yucca (*Y. schidigera*)
__ ____ Mormon tea (*Ephedra* spp.)
__ ____ Cactus: ________________
__ ____ Sunflower (*Helianthus* spp.)
__ ____ Joshua Tree (*Y. brevifolia*)
__ ____ Grass: ________________
__ ____ Agave
__ ____ Saltbush (*Atriplex* spp.)
__ ____ Mesquite (*Prosopsis juliflora*)

on near
__ ____ Screwbean (P. pubescens)
__ ____ Catclaw (*Acacia greggii*)
__ ____ Banana yucca (*Y. baccata*)
__ ____ Blackbrush (*Coleogyne* spp.)
__ ____ *Mentzelia albicaules*
__ ____ Saltcedar (*Tamarix pentandra*)
__ ____ Juniper (*Juniperus* spp.)
__ ____ Pinyon (*Pinus* spp.)
__ ____ Oak (*Quercus* spp.)
__ ____ Other: ________________
____

Historic Site Survey Form
Western Archeological Center Field No. ________ Page 5 of 5

NATIONAL REGISTER
___ should be nominated:
  ___ as an individual site; or
  ___ as part of a district
___ should not be nominated

Discuss reasons for selection checked:

PHOTOS
B&W (roll and frame No.) ________________ Color ________________

Remarks:

Recorded by: ______________________________ Date: ___________

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Site Survey Form
Western Archeological Center

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Project Name ________________ Field No. ________ Site No. ________

Previous Site Designation ____

LOCATION

State ____ County ______________ USGS Quad ________________
T ________ R ________ Section ________, ________ ¼ of the ________ ¼
UTM Zone ______________ Easting ____________ Northing ____________
Ownership ___________ Air Photo Reference ___________ Elevation _____

Draw a map showing how to get to the site. Include roads, washes, and other prominent landmarks.

Describe briefly how to get to the site, mentioning roads, washes, and other prominent landmarks.

SITE

Site Aspects:

___ Open
___ Rockshelter
___ Cave
___ Cache
___ Milling Station
___ Midden
___ Lithic Scatter
___ Sherd Scatter
___ Rock Circle
___ Rock Pile
___ Rock Alignment
___ Surface Depression
___ Hunting Blind
___ Water Control
___ Historic Structure
___ Trail
___ Fire-Affected Rock
___ Other

Area of Site: ______ m^2 Depth: _____ cm _____ Surface _____ Unknown

Describe site features:

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CONDITION OF SITE

___ unaltered
___ erosion
___ deposition

___ vandalized
___ grazed/cultivated
___ previously collected/excavated

___ damaged by ORV
___ damaged by construction
___ damaged by vegetation

Public Access: ____ Restricted ____ Unrestricted ____ Inaccessible

Describe degree of disturbance; locate disturbed areas on map; note present use of area:

ARTIFACTS

Ceramics: No. ______; Types ______________________________
How Much Collected __________ Collection Label __________
Sampling Procedure ______________________________

Lithics: No. ______; No. of Cores ______ No. of Retouched ______
No. of Primary Flakes ______ No. of Secondary Flakes ______
No. of Flakes with no Cortex ____________________

Tool Types:

Materials (by lithic category) ____________________
____
How Much Collected __________ Collection Label __________
Sampling Procedure ______________________________

Ground Stone: No. ______; Types ______________________________
Materials __________ Collection? __________ Label ________

Other Artifacts: Types ______________ Materials ____________________
Collection? ____________________ Label ______________

Describe site and discuss relationship between artifacts, and between artifacts and possible features or structures:

Site Survey Form
Western Archeological Center

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ETHNOGRAPHIC DATA

Group ____________________ Site Name ____________________

References ____

____

Comments:

Time Period ________ Cultural Affiliation ________ Phase ________

Discuss basis for time and cultural affiliation estimates:

TOPOGRAPHY

___ alluvial fan
___ arroyo
___ bluff
___ canyon (floor)
___ canyon (side)
___ cliff
___ floodplain
___ hill
___ mesa
___ mountain
___ plateau
___ playa
___ ridge
___ rockshelter
___ slope
___ talus
___ terrace
___ valley
___ other: (specify)

Gradient (in degrees) ________________ Exposure ________________

Discuss setting of site and description of terrain:

Site Soil:
___ clay
___ silt
___ sand
___ gravel
___ loam
___ other
___ desert pavement

WATER

Nearest Water (wash, spring, etc.) ________ Distance from Site ________

Permanent ________ Intermittent ________

Description of watershed:

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Site Survey Form
Western Archeological Center

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OUTCROPS

outcrop loose
______ ____ sandstone
______ ____ sedimentary (specify)
______ ____ igneous (specify)

outcrop loose
______ ____ metamorphic (specify)
______ ____ other (specify)
______ ____ no outcrops

Note approximate percentage of raw materials (lithic) available:

VEGETATION

__________ Sagebrush scrub
__________ Shadscale scrub
__________ Creosotebush scrub
__________ Alkali sink

__________ Pinyon-Juniper woodland
__________ Joshua Tree woodland
__________ Barren
__________ Other (Specify)

Plant Species Present:

on near
__ ___ Creosote (*Larrea divaricata*)
__ ___ Bursage (*Franseria* spp.)
__ ___ Mohave yucca (*Y. schidigera*)
__ ___ Mormon tea (*Ephedra* spp.)
__ ___ Cactus: __________
__ ___ Sunflower (*Helianthus* spp.)
__ ___ Joshua Tree (*Y. brevifolia*)
__ ___ Grass: __________
__ ___ Agave
__ ___ Saltbush (*Atriplex* spp.)
__ ___ Mesquite (*Prosopsis juliflora*)

on near
__ ___ Screwbean (P. pubescens)
__ ___ Catclaw (*Acacia greggii*)
__ ___ Banana yucca (*Y. baccata*)
__ ___ Blackbrush (*Coleogyne* spp.)
__ ___ *Mentzelia albicaules*
__ ___ Saltcedar (*Tamarix pentandra*)
__ ___ Juniper (*Juniperus* spp.)
__ ___ Pinyon (*Pinus* spp.)
__ ___ Oak (*Quercus* spp.)
__ ___ Other: __________
____

Coverage:

________ Continuous (75%)
________ Interrupted (50-75%)
________ Park-Like (25-50%)

________ Rare (6-25%)
________ Barely Present (2-5%)
________ Absent (0-1%)

Discuss vegetation on and near site. Note concentrations of atypical plants.

PHOTOS

B&W (roll and frame No.) ______________ Color ______________

REMARKS

Research Potential:

Discuss how the site would be useful for specific research problems. Should the site be alidade mapped, intensively collected, tested, or excavated if further mitigation is necessary? Give time estimate for further work.

The Big Picture:

Discuss the site as a whole, and how it relates to the natural environment and to other sites in the area. What is interesting and nifty about the site?

Make a map of the site on graph paper, including important artifacts, features, structures, environmental features, areas of disturbance, and collection areas. Map must have north arrow, scale, and key. Map separately any unusual or significant features. Key to site map.

NATIONAL REGISTER

___ should be nominated:

    ___ as an individual site; or
    ___ as part of a district

___ should not be nominated

Discuss reasons for selection checked:

Archeologists. ______________________________

Date: ____________

REFERENCES

Amsden, Charles A.
1937 The Lake Mohave artifacts. In The archeology of pleistocene Lake Mohave, by E. W. C. Campbell et al. Southwest Museum Papers 11: 51-97.

Antevs, Ernst
1937 Age of the Lake Mohave Culture. In The archeology of Pleistocene Lake Mohave, by E. W. C. Campbell et al. Southwest Museum Papers 11: 45-49.

Baumhoff, Martin A. and Robert E. Heizer
1965 Postglacial climate and archaeology in the desert west. In The Quaternary of the United States, edited by H. E. Wright Jr. and David G. Frey. Pp. 697-707. Princeton University Press, Princeton.

Belden, L. Burr
1956 Goodbye, Death Valley! The tragic 1849 Jayhawker trek. Death Valley 49ers, Inc., Publication No. 5. North Hollywood Printing, Burbank, CA.

Bettinger, Robert L.
1976 The development of pinyon exploitation in central eastern California. The Journal of California Anthropology 3: 81-95.

1977a Aboriginal human ecology in Owens Valley: prehistoric change in the Great Basin. American Antiquity 42: 3-17.

1977b Predicting the archaeological potential of the Iny-Mono region of eastern California. In Conservation archaeology, a guide for cultural resource management studies, edited by Michael Schiffer and George Gumerman. Pp. 217-225. Academic Press, New York.

Binford, Lewis R.
1972 A consideration of archaeological research design. In Contemporary archaeology - a guide to theory and contributions, edited by Mark P. Leone. Pp. 158-177. Southern Illinois University Press, Carbondale.

Blackwelder, Eliot
1933 Lake Manly, an extinct lake of Death Valley. Geographical Review 23(3): 464-471.

Brott, Clark W.
1966 How stones became tools and weapons. In Ancient hunters of the Far West, edited by Richard F. Pourade. Pp. 139-193. Union-Tribune Publishing Co., San Diego.

Butzer, Karl W.
1971 *Environment and archeology*. Aldine Publishing Co., Chicago.

Campbell, Elizabeth C. and William Campbell
1935 The Pinto Basin site. *Southwest Museum Papers* 9.

Campbell, Elizabeth C., *et al*
1937 The archeology of pleistocene Lake Mohave. *Southwest Museum Papers* 11.

Carter, George F.
1957 *Pleistocene man at San Diego*. Johns Hopkins Press, Baltimore.

Chalfant, W. A.
1922 *The story of Inyo*. Pinyon Bookstore, Bishop.

Clements, Lydia
1956 Inferences regarding the ancient inhabitants of Panamint Valley. *The Masterkey* 30(6): 184-190.

Clements, Thomas and Lydia Clements
1953 Evidence of pleistocene man in Death Valley. *Geological Society of America Bulletin* 64: 1189-1204.

Coville, Frederick V.
1892 The Panamint Indians of California. *American Anthropologist* 5: 351-361

Craib, John L.
1978 *Death Valley National Monument: archeological survey of 187 mining claims*. National Park Service, Western Archeological Center, Tucson.

Davis, Emma Lou
1969 M-175: a Paleo-Indian site in Mohave Desert Mountains. Progress report, Western Archeological Center Archives No. 278.

1970 Archaeology of the north basin of Panamint Valley, Inyo County, California." *Nevada State Museum Anthropological Papers* 15: 83-141.

1978a "Baloon and bulldozer: tools for geoarchaeological interpretation. *Society for California Archaeology, Occasional Papers* 2: 1-13.

1978b *The ancient Californians: Rancholabrean hunters of the Lake Mohave lakes country*. Natural History Museum of Los Angeles County, Los Angeles.

Davis, E. L., C. W. Brott and D. L. Weide
1969 The western lithic co-tradition. *San Diego Museum of Man Papers* No. 6.

Davis, Emma Lou and David Fortsch
1970 Extinct fauna and Early Man in the Mohave Desert, California: a progress report. Western Archeological Center Archives No. 207.

Davis, Emma Lou and Richard Shutler, Jr.
1969 Recent discoveries of fluted points in California and Nevada. *Nevada State Museum Anthropological Papers* 14(7): 154-177.

Death Valley National Monument
n.d. Concessionaire files, 1937-1952. On file Death Valley National Monument.

U.S. Department of the Interior
1977 Draft: Natural and cultural resources management plan and environmental statement for Death Valley National Monument, California-Nevada. Manuscript on file Western Archeological Center, Tucson.

Driver, Harold E.
1937 Culture element distributions VI: southern Sierra Nevada. *University of California Anthropological Records* 1(2).

Durrenberger, Robert W. and Robert B. Johnson
1976 *California patterns on the land*. Mayfield Publishing Company, Palo Alto.

Dutcher, B. H.
1893 Pinyon gathering among the Panamint Indians. *American Anthropologist* 6: 377-380.

Ericson, Jonathon E.
1977 Egalitarian exchange systems in California: a preliminary view. In *Exchange systems in prehistory*, edited by Timothy K. Earle and Jonathon E. Ericson. Pp. 109-126. Academic Press, New York.

1978 Obsidian hydration dating in California. *Society for California Archaeology, Occasional Papers* 2: 45-52.

Goodyear, Albert C.
1977 Research design in highway archaeology: an example from South Carolina. In *Conservation archaeology, a guide for cultural resource management studies*, edited by Michael Schiffer and George Gumerman. Pp. 157-165. Academic Press, New York.

Grant, Campbell, James W. Baird and J. Kenneth Pringle
1968 Rock drawings of the Coso Range, Inyo County, California. *Publication 4, Maturango Museum Papers*.

Grosscup, Gordon L.
1960 Mohave Desert pipeline survey. Western Archeological Center Archives No. 206.

Grosscup, Gordon L. (cont.)
1977 Notes on boundaries and culture of the Panamint Shoshone and Owens Valley Paiute. University of California Archaeological Research Facility, Contributions 35: 129-150.

Harrington, Mark R.
1933 Gypsum Cave, Nevada. Southwest Museum Papers 8.

1957 A Pinto site at Little Lake, California. Southwest Museum Papers 17.

Harrington, Mark R. and Ruth D. Simpson
1961 Tule Springs, Nevada, with other evidences of Pleistocene man in North America. Southwest Museum Papers 18.

Haury, Emil W.
1950 The stratigraphy and archaeology of Ventana Cave. University of Arizona Press, Tucson.

Heizer, Robert F. and Martin A. Baumhoff
1962 Prehistoric rock art of Nevada and eastern California. University of California Press, Berkeley.

Heizer, Robert F. and C. W. Clewlow, Jr.
1973 Prehistoric rock art of California. Ballena Press, Ramona.

Hester, Thomas Roy
1973 Chronological ordering of Great Basin prehistory. University of California Archaeological Research Facility Contributions 17.

Hinds, Norman E. A.
1952 Evolution of the California landscape. California Division of Mines Bulletin 158.

Hooke, Roger LeB.
1972 Geomorphic evidence of late Wisconsin and holocene tectonic deformation, Death Valley, California. Geological Society of America Bulletin 83: 2073-2098.

Hubbard, Paul B., Doris Bray and George Pipkin
1965 Ballarat 1897-1917, facts and folklore. P. B. Hubbard, Lancaster.

Hunt, Alice
1960 Archeology of the Death Valley Salt Pan, California. University of Utah Anthropological Papers No. 47.

Hunt, Charles B.
1975 Death Valley: geology, ecology, archeology. University of California Press, Berkeley.

Jaeger, Edmund C.
1975 A naturalist's Death Valley. Death Valley 49ers, Inc., Publication No. 5. North Hollywood Printing, Burbank.

Jennings, Jesse D.
1964 The desert west. In *Prehistoric man in the New World*, edited by Jesse D. Jennings and Edward Norbeck. Pp. 149-174. University of Chicago Press, Chicago.

1974 *Prehistory of North America*. McGraw-Hill, New York.

Jennings, Jesse D. and Edward Norbeck
1955 Great Basin prehistory: a review. *American Antiquity* 21 (1): 1-11.

Kirk, Ruth
1976 *Exploring Death Valley*. Stanford University Press, Stanford.

Koenig, George
1971 '23' Skidoo and Panamint, too! 22nd Death Valley 49ers encampment. *Keepsake* 11.

Krieger, Alex D.
1964 Early Man in the New World. In *Prehistoric man in the New World*, edited by Jesse D. Jennings and Edward Norbeck. Pp. 23-81. University of Chicago Press, Chicago.

Kritzman, George
1979 *Excavation at Grapevine Canyon Rock Shelter No. 2 (Iny-378), Death Valley National Monument*. Western Archeological Center, Tucson.

Kroeber, Alfred L.
1925 Handbook of the Indians of California. *Bureau of American Ethnology Bulletin* 78.

Lanning, Edward P.
1963 Archaeology of the Rose Spring site, INY-372. *University of California Publications in American Archaeology and Ethnology* 49(3): 237-336.

Lathrap, D. W. and C. W. Meighan
1951 An archaeological reconnaissance in the Panamint Mountains. *University of California Archaeological Survey, Reports* 11: 11-33.

Leakey, L. S. B., R. D. Simpson and T. Clements
1968 Archaeological excavations in the Calico Mountains, California: preliminary report. *Science* 160: 1022-1023.

Levy, Benjamin
1969 *Death Valley National Monument historical background study*. Divison of History, National Park Service, Washington, D.C.

MacNeish, Robert S.
1979 Review of the ancient Californians: Rancholabrean hunters of the Lake Mohave lakes country. *American Antiquity* 44(3): 630-631.

Mallery, Garrick
1893 Picture writing of the American Indians. Bureau of American Ethnology, Tenth Annual Report.

Martin, Paul S. and Peter J. Mehringer
1965 Pleistocene pollen analysis and biogeography of the Southwest. In The Quaternary of the United States, edited by H. E. Wright Jr. and David G. Frey. Pp. 433-451. Princeton University Press, Princeton.

Mattes, Merrill J. and Robert V. Simmonds
1970 Charcoal kilns, Wildrose Canyon, Death Valley National Monument, California. In Historic structures report. National Park Service, Office of History and Historic Architecture, San Francisco.

Mehringer, Peter J.
1967a Pollen analysis of the Tule Springs area, Nevada. Nevada State Museum Anthropological Papers 13: 129-200.

1967b Environment of extinction in the arid Southwest. In Pleistocene extinctions: the search for a cause, edited by P. S. Martin and H. E. Wright Jr. Pp. 247-266. Yale University Press, New Haven.

Mehringer, Peter J. and Claude N. Warren
1976 Marsh, dune, and archaeological chronology, Ash Meadows, Amargosa Desert, Nevada. Nevada Archaeological Survey Research Paper 6: 120-150.

Meighan, Clement W.
1953 The Coville Rock Shelter, Inyo County, California. University of California Anthropological Records 12(5): 171-223.

Meighan, Clement W. and C. Vance Haynes
1970 The Borax Lake site revisited. Science 167(3922): 1213-1221.

Minshall, Herbert L.
1976 The broken stones. Copley Press, San Diego.

Morrison, R. B.
1965 Quaternary geology of the Great Basin. In The Quaternary of the United States, edited by H. E. Wright Jr. and David G. Frey. Pp. 265-285. Princeton University Press, Princeton.

Munz, Philip A. and David D. Keck
1959 A California flora. University of California Press, Berkeley.

Nelson, E. W.
1891 The Panamint and Saline Valley Indians. American Anthropologist 4: 371-372.

Norris, Robert M. and Robert W. Webb
1976 Geology of California. John Wiley and Sons, New York.

Norwood, Richard H. and Charles S. Bull
1978 A cultural resource overview of the Eureka, Saline, Panamint, and Darwin region: east central California. Bureau of Land Management, California Desert Planning Staff, Riverside.

Ornduff, Robert
1974 Introduction to California plant life. University of California Press, Berkeley.

Orr, Phil C.
1960 Late pleistocene marine terraces on Santa Rosa Island, California. Geological Society of America Bulletin 71: 1113-1119.

Plog, Fred, Margaret Weide and Marilyn Stewart
1977 Research design in the SUN: Binghamton Contract Program. In Conservation archaeology, a guide for cultural resource management studies, edited by Michael Schiffer and George Gumerman. Pp. 107-120. Academic Press, New York.

Preston, R. N.
1974 Early California, southern edition. Binford and Mort, Portland.

Rogers, Malcolm J.
1939 Early lithic industries of the lower basin of the Colorado River and adjacent desert areas. San Diego Museum Papers 3.

1966 The ancient hunters — who were they? In Ancient hunters of the Far West, edited by Richard F. Pourade. Pp. 21-108. Union-Tribune Publishing Co., San Diego.

Sanchez, Peter G.
1973 Hunter Mountain pinyon nut camp. Manuscript on file Visitor Center, Death Valley National Monument.

Simpson, Ruth D.
1958 The Manix Lake archaeological survey. The Masterkey 32(1): 4-10.

Stanley, Dwight A., Gary M. Page and Richard Shutler Jr.
1970 The Cocanour site: a western Nevada Pinto Phase site with two excavated 'house' rings. Nevada State Museum Anthropological Papers 15: 1-44.

State of California
1977 Geologic map of California, Death Valley sheet. California Divison of Mines and Geology, Sacramento.

Steward, Julian H.

1929 Petroglyphs of California and adjoining states. University of California Publications in American Archaeology and Ethnology 24(2).

1933 Ethnography of the Owens Valley Paiute. University of California Publications in American Archaeology and Ethnology 33 (3): 233-350.

1938 Basin-plateau aboriginal socio-political groups. Bureau of American Ethnology Bulletin 120.

1941 Culture element distributions XIII: Nevada Shoshone. Anthropological Records 4(2).

Storer, Tracy I. and Robert L. Usinger

1970 Sierra Nevada natural history. University of California Press, Berkeley.

Teague, George A. and Lynette O. Shenk

1977 Excavations at Harmony Borax Works. Western Archeological Center Publications in Anthropology No. 6.

Trubowitz, Neal L.

1977 Archaeological research design for the Genesee Expressway. In Conservation archaeology, a guide for cultural resource management studies, edited by Michael Schiffer and George Gumerman. Pp. 145-149. Academic Press, New York.

True, D. L., E. L. Sterud and E. L. Davis

1967 An archaeological survey at Indian Ranch, Panamint Valley, California. University of California, Los Angeles, Archaeological Survey Annual Report, 9: 1-24.

Tuohy, Donald R.

1969 Breakage, burin facets, and the probable technological linkage among Lake Mohave, Silver Lake, and other varieties of Paleo-Indian projectile points in the desert west. Nevada State Museum Anthropological Papers 14(6): 132-152.

1970 The Coleman locality: a basalt quarry and workshop near Falcon Hill, Nevada. Nevada State Museum Anthropological Papers 15: 145-205.

1971 Review of the western lithic co-tradition. American Anthropologist 73: 417-418.

Tweed, William

1976 Cultural resources survey: Death Valley National Monument. Division of Historic Preservation, Western Regional Office, National Park Service, San Francisco.

Wallace, William J.

1954 Preliminary notes on an archeological reconnaissance of Mesquite Flat, Death Valley National Monument, California. Manuscript on file Western Archeological Center, Tucson.

1958a Archeological sites in the vicinity of Saratoga Springs, Death Valley National Monument, California. Manuscript on file Western Archeological Center, Tucson.

1958b Archaeological investigations in Death Valley National Monument, 1952-1957. *University of California Archaeological Survey Reports* 42: 7-22.

1962 Prehistoric cultural development in the southern California deserts. *American Antiquity* 28(2): 172-180.

1968a An archaeological survey of the southern California Edison Company distribution line in Death Valley National Monument. *Contributions to California Archaeology* 6.

1968b Archaeological explorations in the northern section of Death Valley National Monument. Manuscript on file, Western Archeological Center, Tucson.

1971 The Wildrose charcoal kilns: the archeological Record. Manuscript on file Western Archeological Center, Tucson.

1977 *Death Valley National Monument's prehistoric past: an archeological overview*. National Park Service, Western Archeological Center, Tucson.

1978a Post-pleistocene archeology, 9000 to 2000 B.C. In *Handbook of North American Indians* 8: 25-36.

1978b *Trial excavations at two prehistoric sites in the Saratoga Springs area, Death Valley National Monument, California*. Western Archeological Center, Tucson.

Wallace, William J. and Edith S. Taylor

1955 Archaeology of Wildrose Canyon, Death Valley National Monument. *American Antiquity* 20(4): 355-367.

1956 "The Surface Archeology of Butte Valley, Death Valley National Monument." *Contributions to California Archaeology* 1. Los Angeles.

1959 A preceramic site at Saratoga Springs, Death Valley National Monument, California. *Contributions to California Archaeology* 3(2).

Wallace, William J. and Edith Wallace

1978 *Ancient people and cultures of Death Valley National Monument*. Acoma Books, Ramona, CA.

Weide, David L.
1976 The Altithermal as an archeological 'non-problem' in the desert west. Nevada Archeological Survey Research Paper 6: 174-184.

Weight, Harold O.
1970 Lost mines of Death Valley. Calico Press, Twentynine Palms.

Wheat, Carl I.
1939a Trailing the Forty-Niners through Death Valley. Sierra Club Bulletin 24(3): 74-108.

1939b Pioneer visitors to Death Valley after the Forty-Niners. California Historical Society Quarterly 18(3): 195-216.

Whitney, J. D.
1865 Geological survey of California. Geology 1.

Willey, Gordon R.
1966 An introduction to American archaeology. In North and Middle America, Volume 1. Prentice-Hall, Englewood Cliffs.

Willey, Gordon R. and Philip Phillips
1958 Method and theory in American archaeology. University of Chicago Press, Chicago.

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